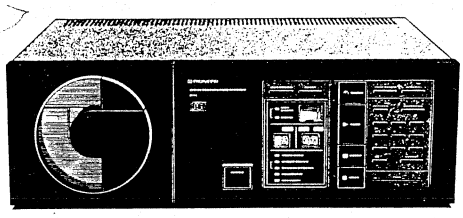
Service Manual



ORDER NO.
VRT-011-0

COMPACT DISC PLAYER

P-D1 HEO/S

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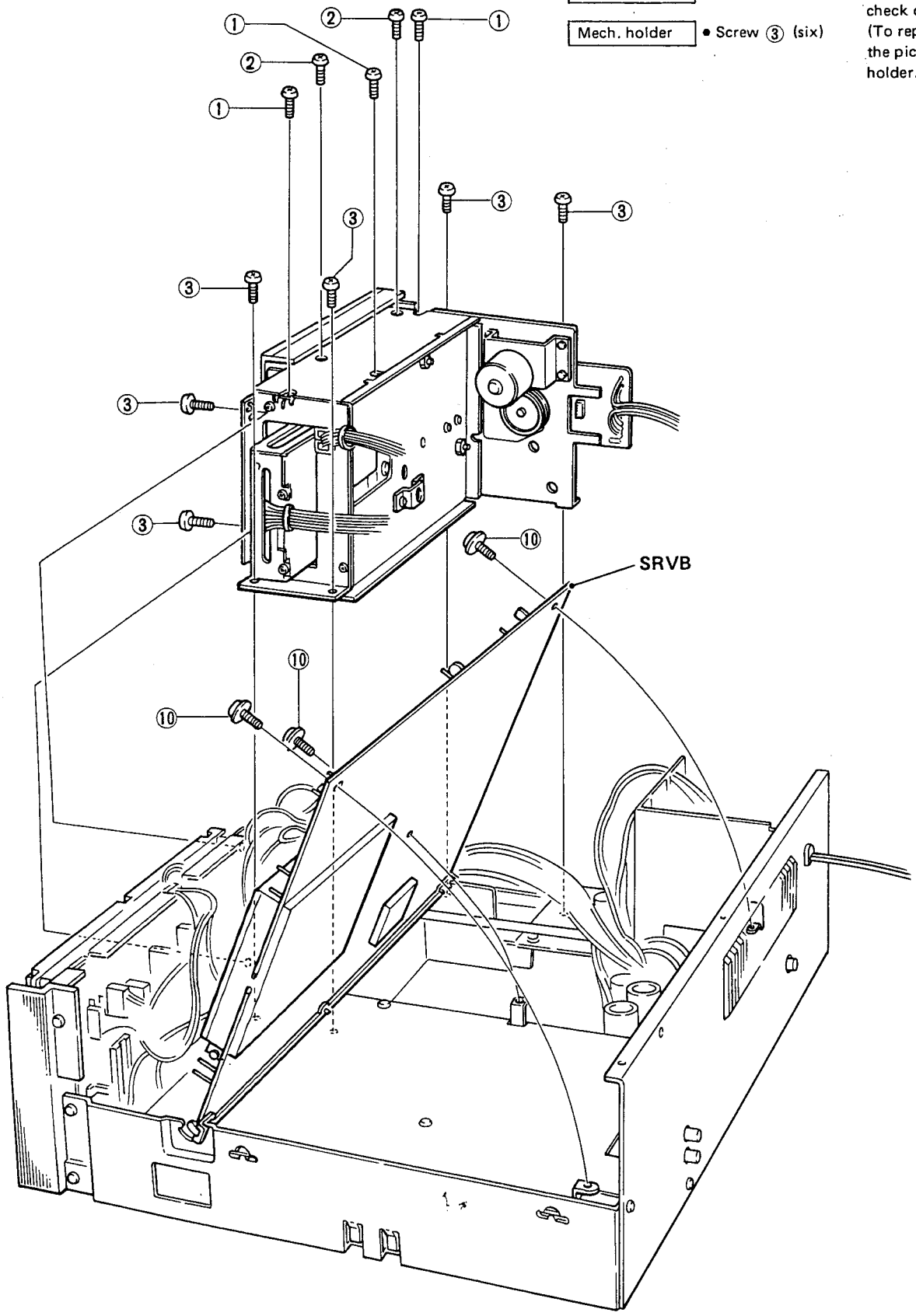
PIONEER®

1. DISASSEMBLY

1. Disc Mechanism Assembly

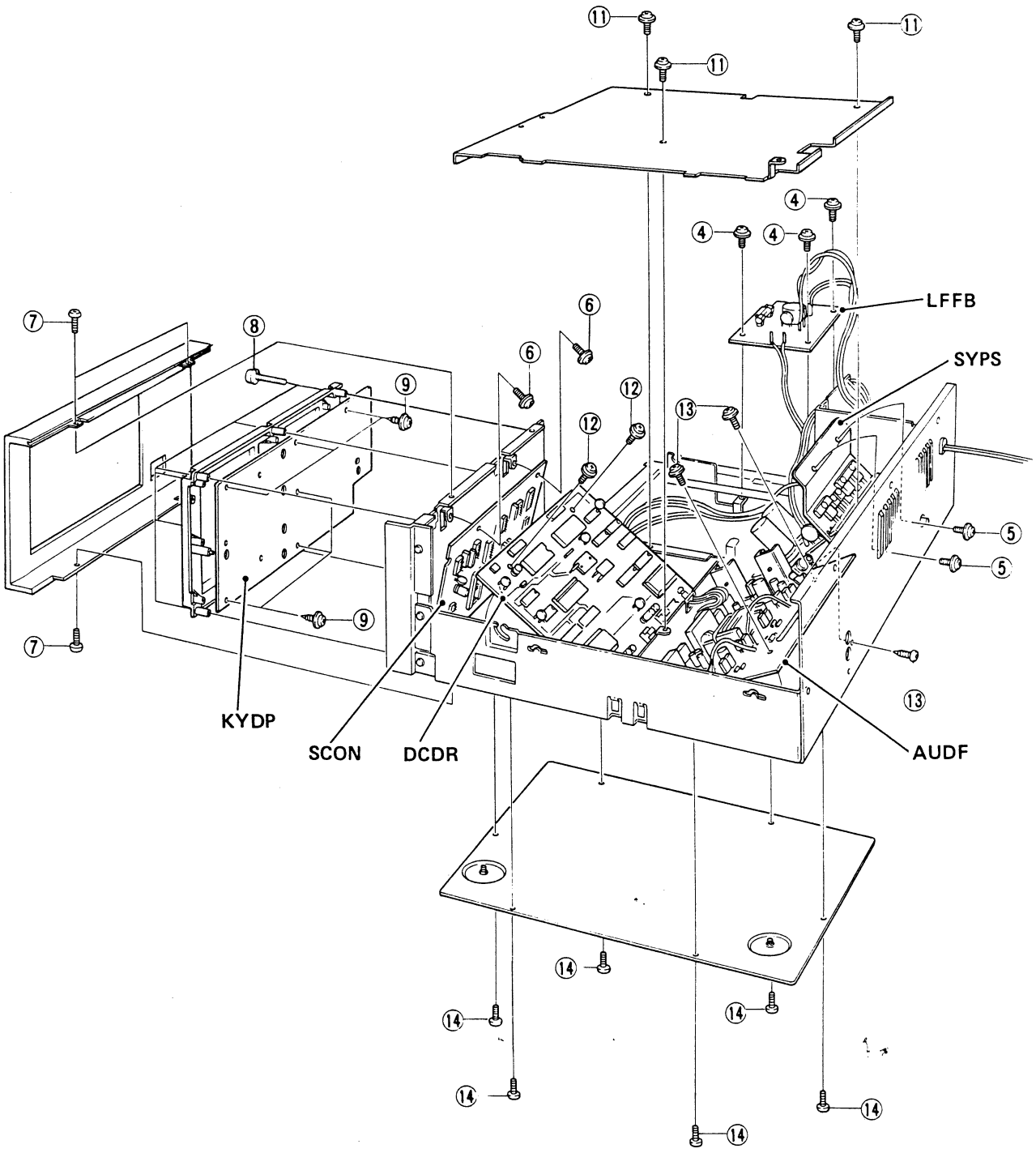
Part	Procedure	Purpose
Cover	• Screw ① (three)	(To check carriage assembly, etc.)
Escutcheon	• Screw ② (two)	(To measure LD power, check objective lens, etc.)
Mech. holder	• Screw ③ (six)	(To repair HALC or replace the pickup and mechanism holder.)



2. Circuit Boards

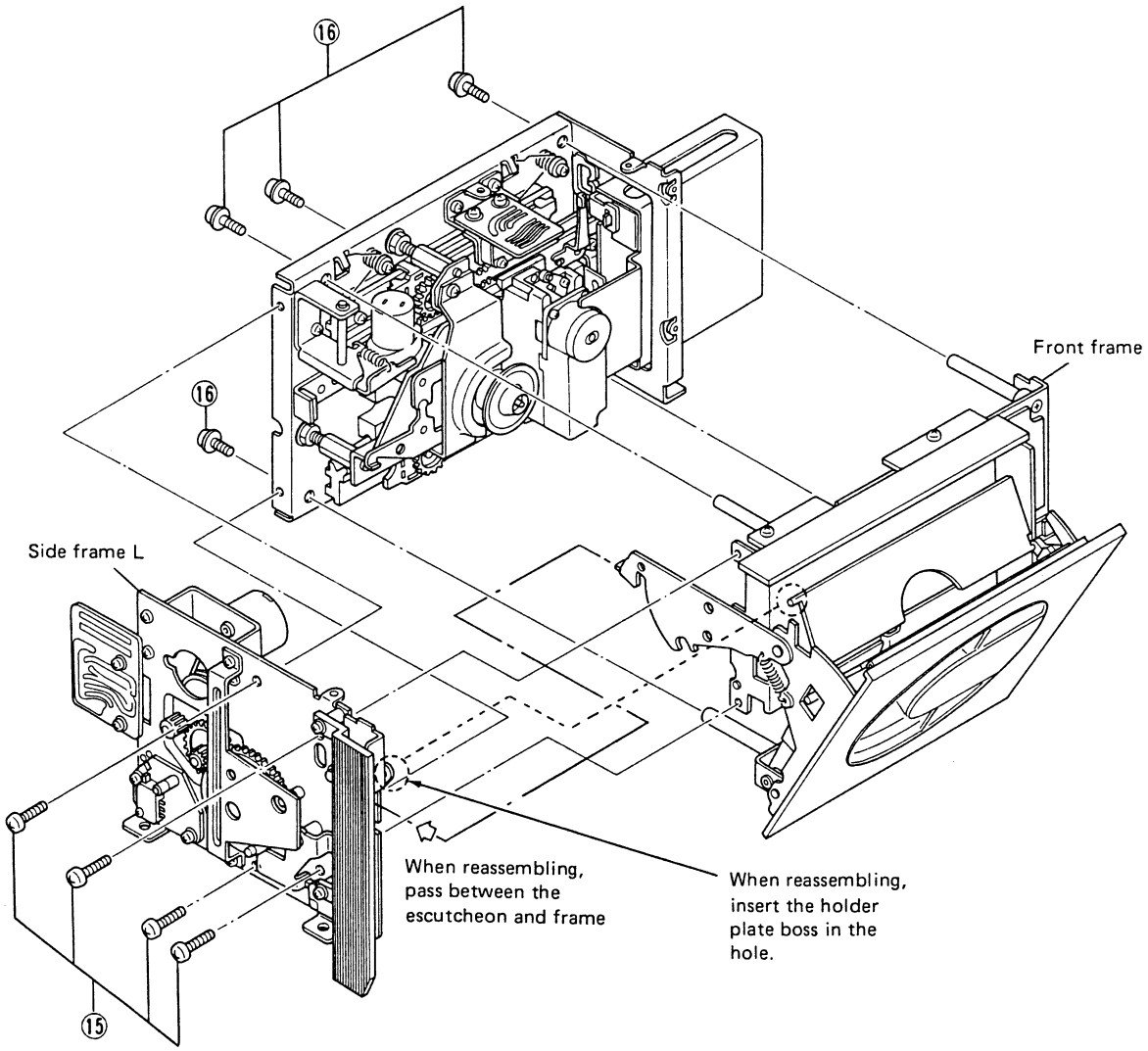
Part	Procedure	Purpose
LFFB	• Screw ④ (three)	(For repairs)
SYPS	• Screw ⑤ (two)	(For repairs)
SCON	• Screw ⑥ (two)	(To check the system and for repair)
Front panel	• Screw ⑦ (four)	
Control panel	• Screw ⑧ (six)	
KYDP	• Screw ⑨ (six)	(For repairs)

Part	Procedure	Purpose
SRVB	• Screw ⑩ (three)	(For adjustments and repairs and for access to DCDR and AUDF)
Shielding cover	• Screw ⑪ (three)	(For access to DCDR and AUDF)
DCDR	• Screw ⑫ (two)	(For repairs)
AUDF	• Screw ⑬ (three)	(For repairs)
Bottom cover	• Screw ⑭ (six)	(For access to DCDR and AUDF)



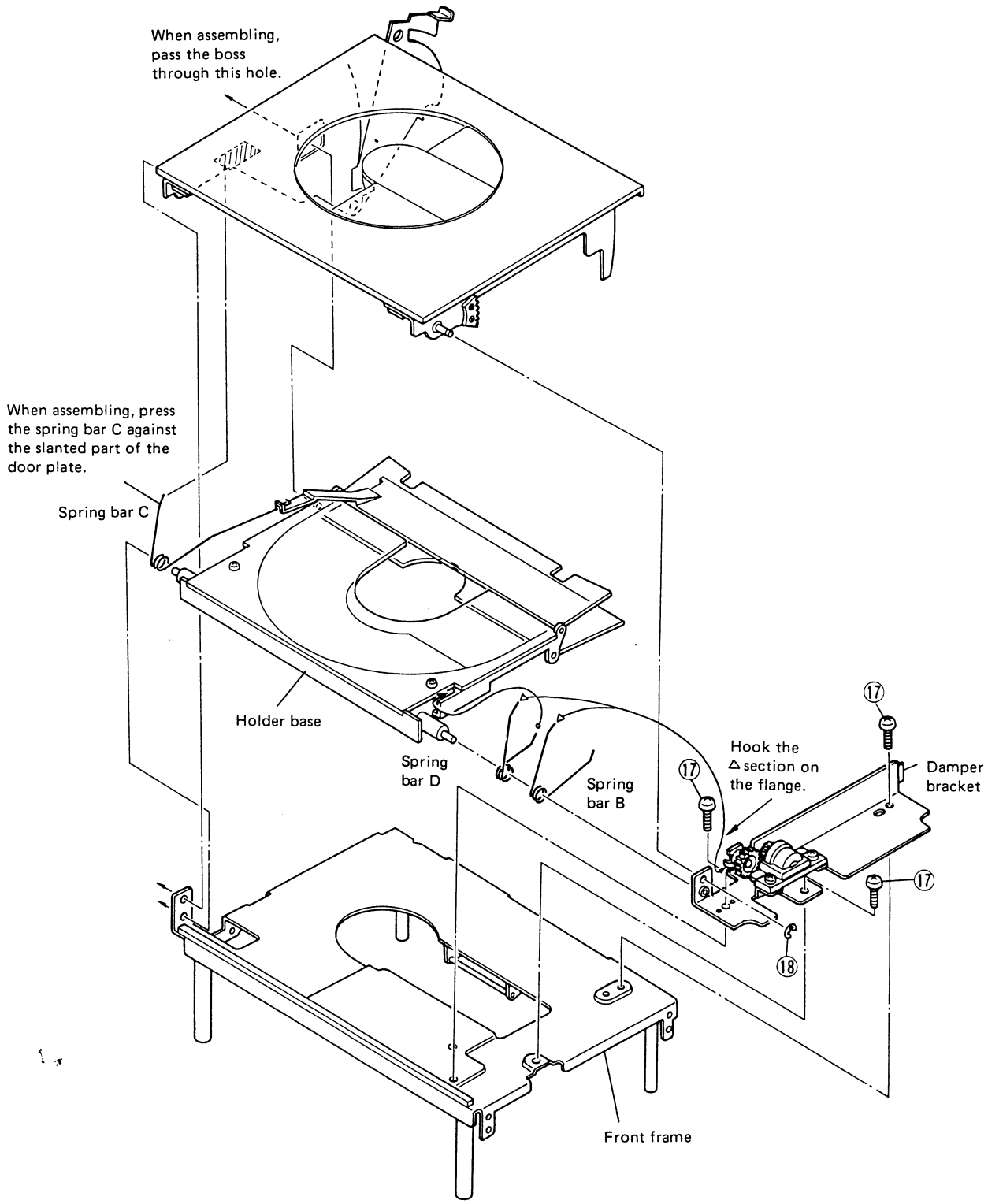
3. Disassembly from the Mechanism Holder

Part	Procedure	Purpose
Side frame L	• Screw ⑮ (four)	(For access to the spindle motor and pickup)
Front frame	• Screw ⑯ (four)	(For access to the spindle motor and pickup and to replace the door panel)



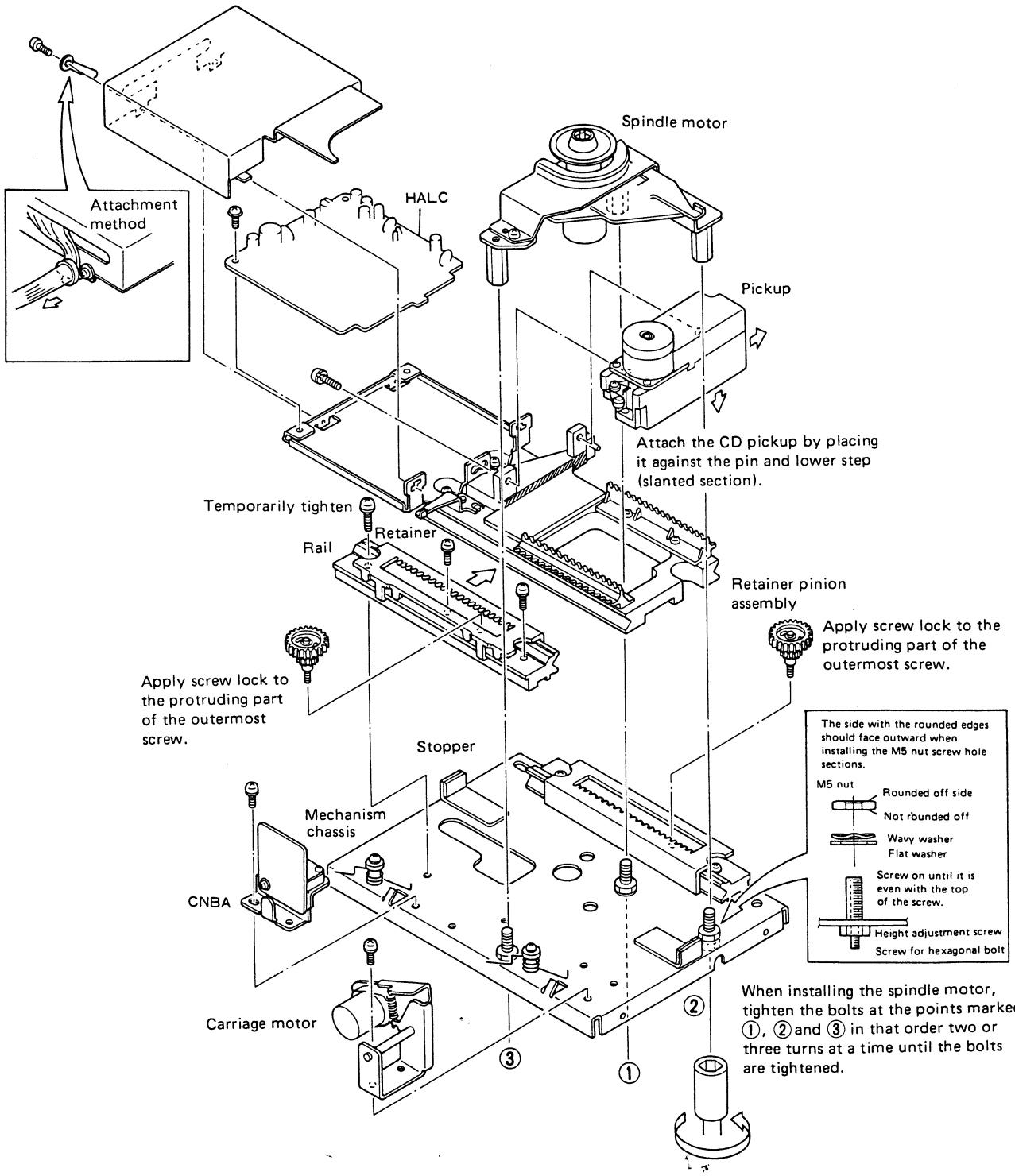
4. Disassembly from the Front Frame

Part	Procedure	Purpose
Damper bracket	• Screw ⑰ (three)	
Door panel section	• E-ring ⑱ (one)	(To replace the door panel)
Disc holder section		(To replace the disc holder)



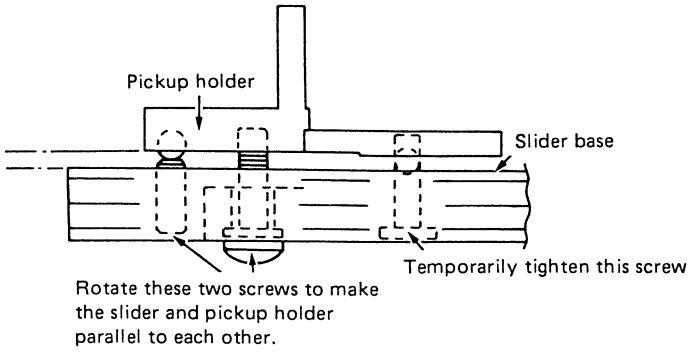
2. MECHANICAL ADJUSTMENT

1. ASSEMBLING THE MECHANISM ASSEMBLY



1. Rough Adjustment of Pickup Holder Angle

- This procedure is necessary only when the pick-up holder is way out of line. Do not perform if only a minor adjustment is needed.



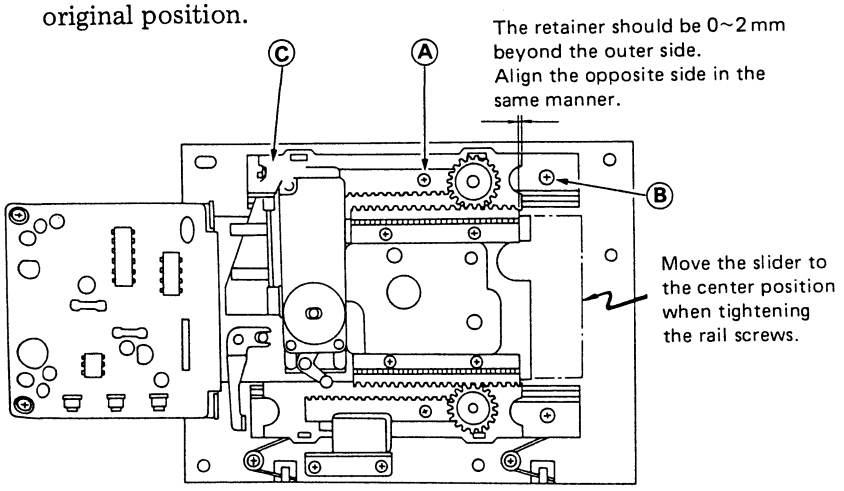
2. Tightening the Upper Rail Screws

1) Attach the rail and slider, temporarily tightening all three screws.
2) Hook the plate spring on the flange on top of the mechanism chassis and press the rail onto the slider.
3) Place the slider in the center position and firmly tighten the three screws A , B and C in that order.

Note: Do not loosen the bottom rail (the one held in place with the red screws) or the stoppers.

3. Aligning the Retainer

1) Retainer alignment is performed with the spindle motor assembly removed from the mechanism chassis.
2) Loosen the retainer pinion assembly so that the retainer can be moved for realignment.
3) Set the slider to where it is as far as possible from the spindle motor and then align the retainer with the edge of the rack.
4) Return the retainer pinion assembly to its original position.

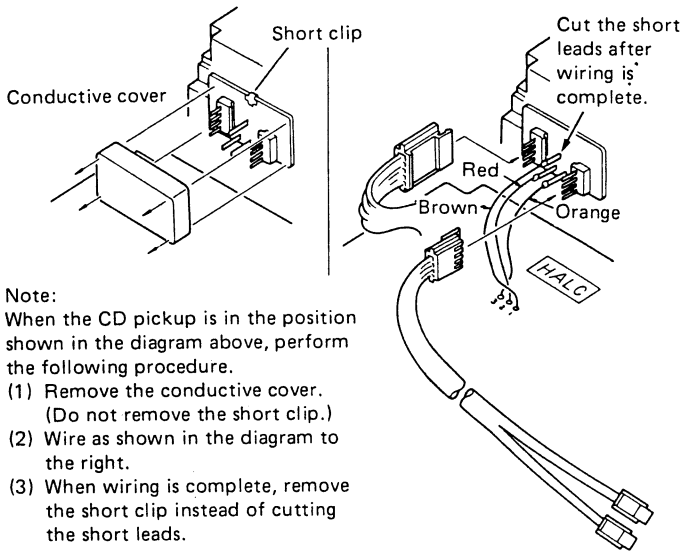


4. Replacing the Pickup

Note: When replacing the pickup, be absolutely sure to take measures to deal with static electricity in the pickup.

- Before beginning the pickup replacement procedure, place a conductive mat on the work bench and place the mechanism assembly and new pickup (with protective materials) on the mat.
- Cover shirt and trouser cuffs with a conductive cover and connect it to the conductive mat.
- Use a battery powered soldering iron and ground the tip of the iron on the conductive mat. (Never ground an iron connected to an AC power supply with the conductive mat.)
- In order to protect the new pickup, insert a short clip in the LD terminals, attach the conductive cover and keep the entire pickup unit in the conductive bag, completely packed, during the replacement procedure.

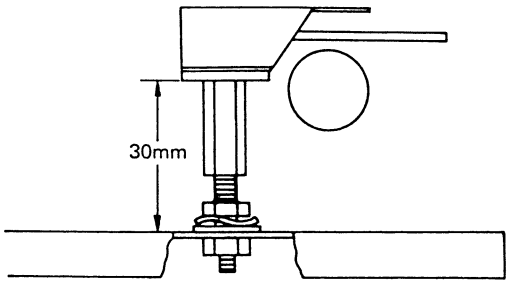
Note: After replacing the pickup, the height of the spindle motor must be readjusted.



Note:
When the CD pickup is in the position shown in the diagram above, perform the following procedure.
(1) Remove the conductive cover. (Do not remove the short clip.)
(2) Wire as shown in the diagram to the right.
(3) When wiring is complete, remove the short clip instead of cutting the short leads.

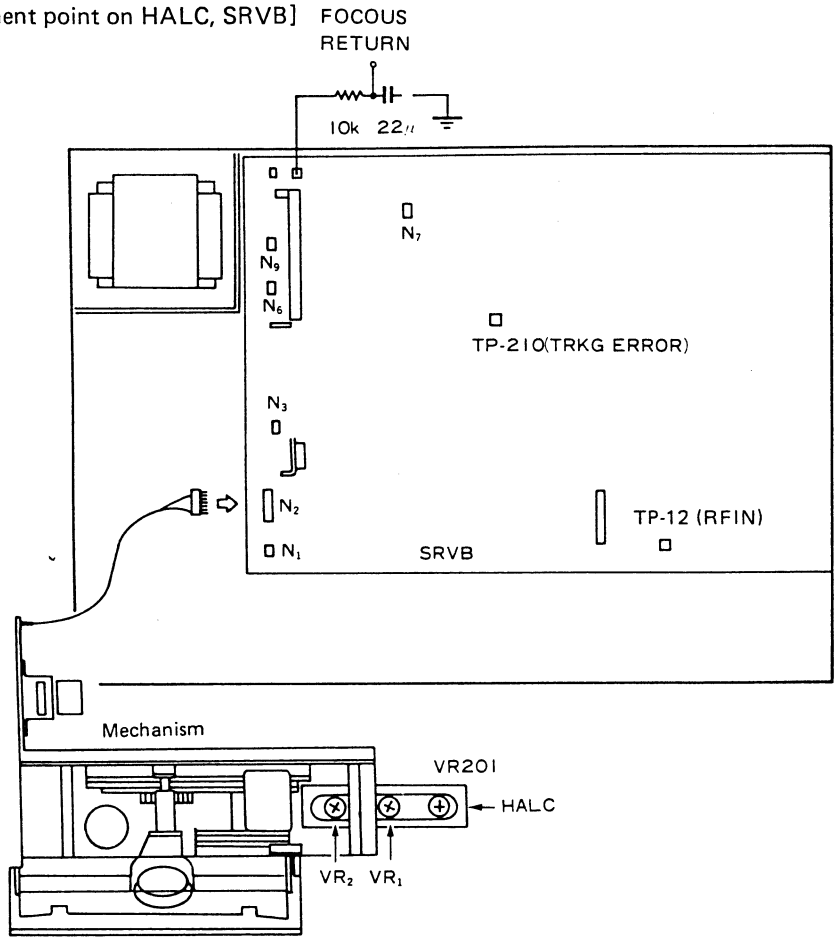
5. Attaching the Spindle Motor Ass'y to the Mechanism Chassis

1) From the bottom of the mechanism chassis, turn bolts Ⓐ, Ⓑ and Ⓒ, in that order, clockwise two or three rotations at a time.
2) Set the spindle motor in place so the bottom surface of the spindle motor holder is 30 mm from the top surface of the mechanism chassis at each bolt (Ⓐ, Ⓑ and Ⓒ).

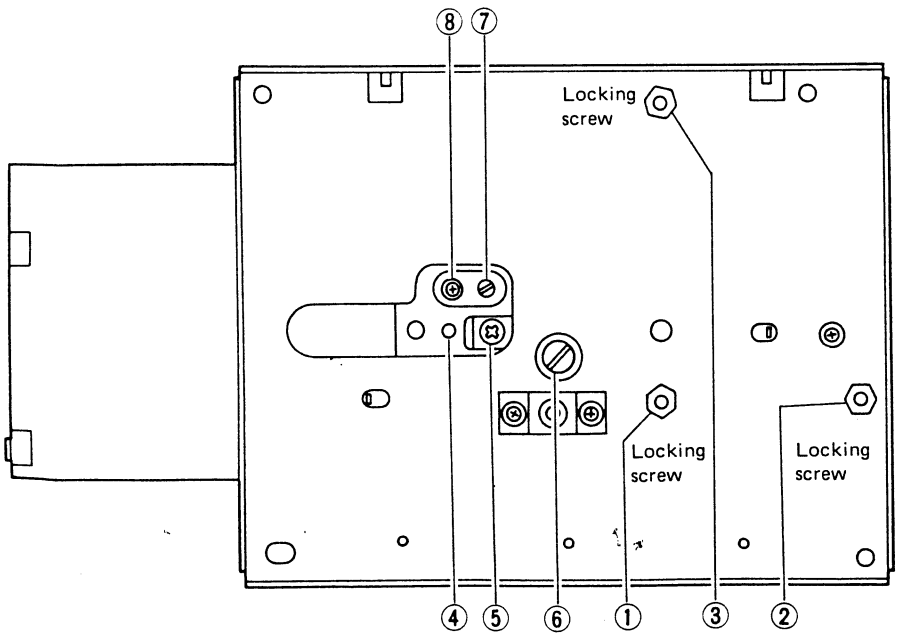


2. ADJUSTMENT

[Connection and adjustment point on HALC, SRVB]



[Adjustment point]



	Names of adjustment points
1	Height adjustment bolt 1
2	Height adjustment bolt 2
3	Height adjustment bolt 3
4	Pickup angle adjustment screw
5	Pickup angle stopper screw
6	Pickup attachment screw
7	Eccentric cam shaft
8	Eccentric cam attachment screw

Step No.	Player Mode	Oscilloscope Range		Test Point	Adj. Point	Adjustment Checking Procedure
		CH-1	CH-2			

MEASUREMENT INSTRUMENTS AND TOOLS

- Dual trace oscilloscope.
- Light power meter.
- Test disc (YEDS-3).

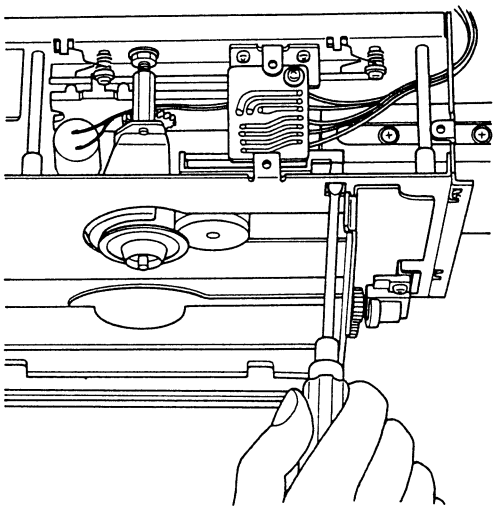
PRECAUTIONS

- Rough adjustment of the spindle motor height must be performed beforehand.
- The pickup holder must not be tilted in relation to the slider.
- There should be no abnormalities in the player itself.
- 10:1 probes are used in these adjustments. Scope range is shown with the probe in use.

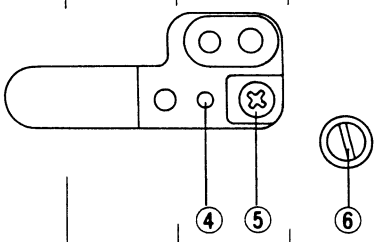
PREPARATIONS

- Perform adjustment checks with the mechanism section removed from the player chassis.
- Remove the CNBA board from the board holder.
- Once the connector housing of the mechanism section is removed, confirm that it is connected as described in the table below.
- Put the player in the test mode. (Turn power on while pressing the SCON board push switch.)

Mechanism section connector housing		SRVB Connector
Brown lead	2P	N1
Orange lead	2P	N3
Green lead	2P	N5
Blue lead	2P	N6
Purple lead	2P	N7
White lead	2P	N9
The above leads are color coded.		
9P Connector housing		N10
7P (CNBB)		N2

Step No.	Player Mode	Oscilloscope Range		Test Point	Adj. Point	Adjustment Checking Procedure
		CH-1	CH-2			
1		–	–	–	HALC VR201	LASER OUTPUT ADJUSTMENT • Turn the HALC VR201 fully counterclockwise. • Set the sensor of the light power meter in front of the objective lens. • Release the beam shutter. 
	REPEAT	–	–	–	HALC VR201	• Press the repeat button (LD ON). • Slowly turn the HALC VR201 clockwise until the power meter shows a strength of about 0.2mW. (Do not turn VR201 rapidly.) • Move the sensor of the power meter around the objective lens to find the point where the power is highest. • While holding the sensor at that point, adjust VR201 again so the output becomes 0.3mW ± 0.01mW. • Again move the sensor around the objective lens and confirm that the power meter reading does not exceed the maximum value found earlier. • Press the repeat button again (LD OFF). *Note: Since the semiconductor laser will be destroyed if its output exceeds the standard, be sure the output is not more than 0.35mW.*

Step No.	Player Mode	Oscilloscope Range CH-1	Oscilloscope Range CH-2	Test Point	Adj. Point	Adjustment Checking Procedure
2	PLAY Numeric button 1	–	0.1V/div 2ms/div	SRVB TP-210	Adjust-ment screw 4 lock screw 5	PICKUP ANGLE ADJUSTMENT • Insert the test disc and press the play button. (START UP) • Connect the oscilloscope (CH-2) to TP-210 (TRKG ERROR). • Press numeric button 1 when the slider is located at the inside of the disc (TRKG OPEN). • Turn the pickup angle adjustment screw (hexagonal screw 4) and, while tightening lock screw 5 , adjust so the noise component of the TRKG error waveform is the same level around both the positive and negative peaks. Repeat this procedure until the levels are the same. *Note: Be careful not to tighten screw 5 too firmly.* Specified torque: 5kg·cm • After performing the adjustments in steps 3, 4 and 5, tighten lock screw 6 . Specified torque: 5kg·cm



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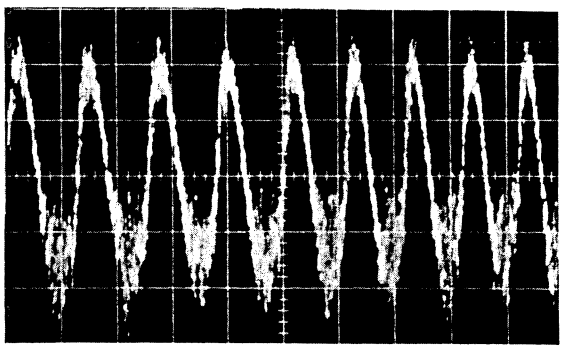
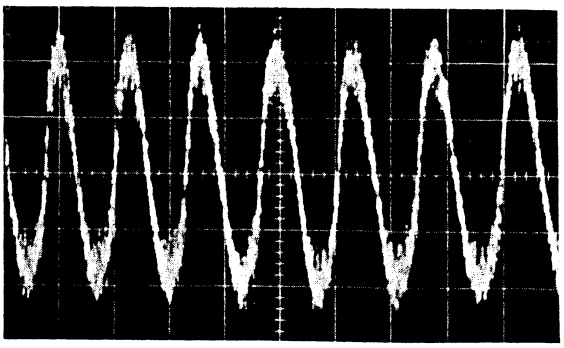


OK



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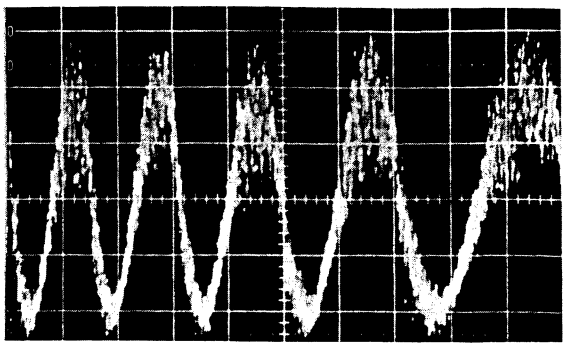
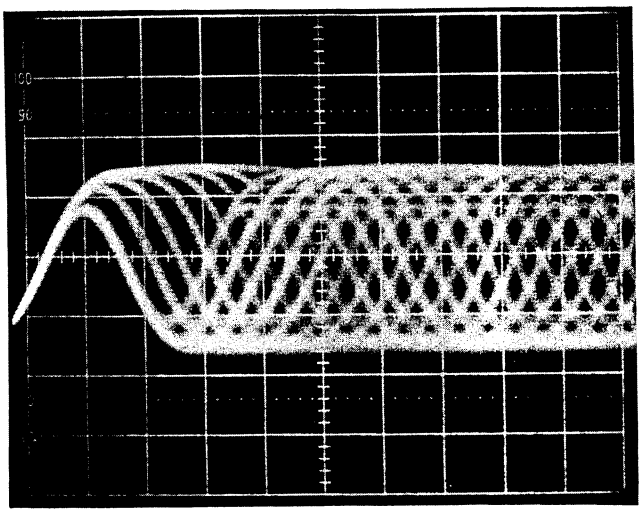
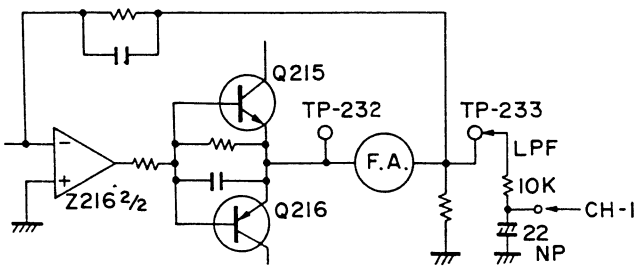
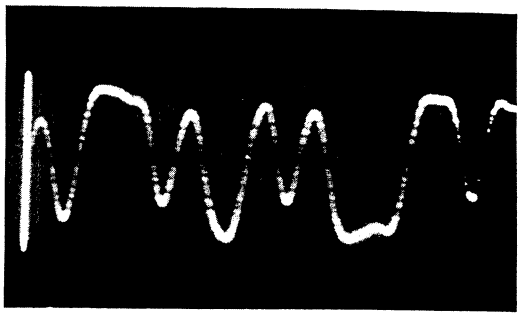
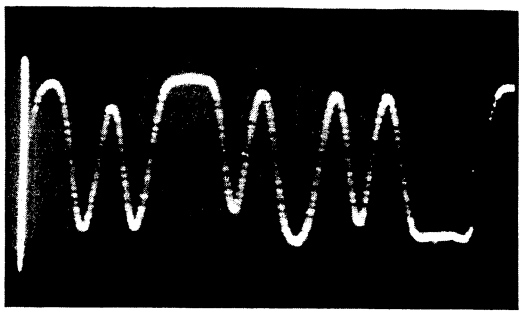
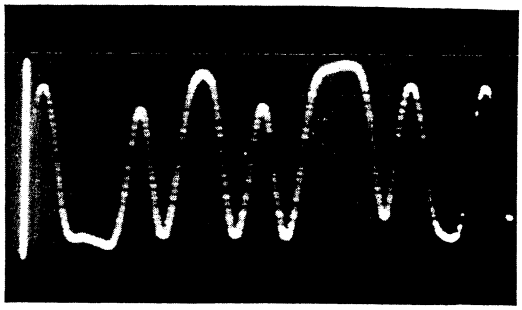
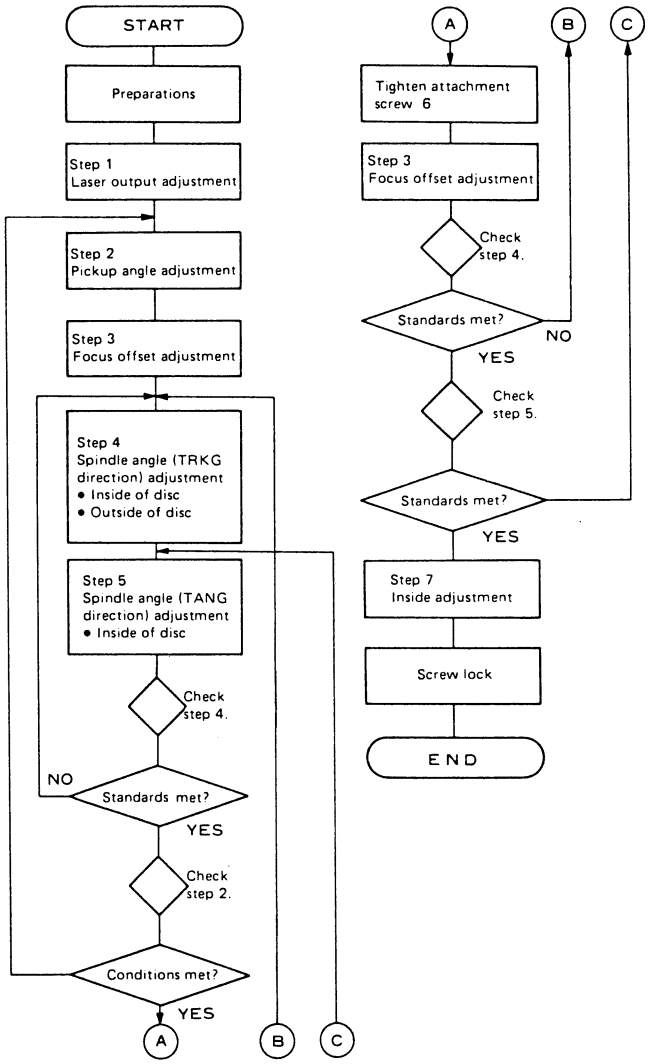


Step No.	Player Mode	Oscilloscope Range CH-1	Oscilloscope Range CH-2	Test Point	Adj. Point	Adjustment Checking Procedure
3	PLAY	—	50mV/div 0.5μS/div	SRVB TP-12	HALC VR1	FOCUS OFFSET ADJUSTMENT • Connect the probe (CH-2) to SRVB TP-12 (RF IN). • Adjust HALC VR1 so the RF signal amplitude is as large as possible. 
4	PLAY Numeric 2	1mV/div 0.5μS/div	—	SRVB TP-233	Height adjustment bolts 1 2	SPINDLE MOTOR ANGLE ADJUSTMENT (in TRKG direction) • Connect the CH-1 probe to SRVB TP-233 (FOCS RTN) through LPF (10kΩ/22μF) and connect CH-2 to SRVB TP-12 (RF IN). • Press numeric key 2 (TRKG CLOSE). • Confirm the ground level of CH-1, and locate the slider at the inside of the disc. • Adjust height adjustment bolt 1 so the focus returning voltage of CH-1 is −30mV ± 10mV. • Press the */TIME button to move the slider to the outside of the disc and then adjust height adjustment bolt 2 so the focus return voltage of CH-1 is -30mV ± 10mV. • Repeat the adjustments for the inside and outside of the disc several times and then tighten the lock screws (hexagonal). Finally, confirm that the voltages for the inside and outside of the disc are within the standard and that the difference between the two voltages is not more than 5mV. 

Step No.	Player Mode	Oscilloscope Range		Test Point	Adj. Point	Adjustment Checking Procedure
		CH-1	CH-2			
5	PLAY	–	50mV/div 0.5μs/div	SRVB TP-12	Height adjustment bolt 3	SPINDLE MOTOR ANGLE ADJUSTMENT (in TANG direction) • Move the slider to the outside of the disc and adjust height adjustment bolt 3 so the CH-2 RF signal waveform peaks become flat. • After tightening the hexagonal lock screws, confirm that the CH-2 waveform has not changed. • Check step 4 again and, if the value is not correct, repeat steps 4 and 5. NG  OK  NG 

Step No.	Player Mode	Oscilloscope Range		Test Point	Adj. Point	Adjustment Checking Procedure
		CH-1	CH-2			
6						PICKUP ANGLE, FOCUS OFFSET AND SPINDLE MOTOR ANGLE FINE ADJUSTMENT • Repeat steps 2, 3, 4 and 5 and readjust wherever necessary so that all values and conditions are as specified. • If a readjustment was performed, always check each item in steps 2, 3, 4 and 5 again.

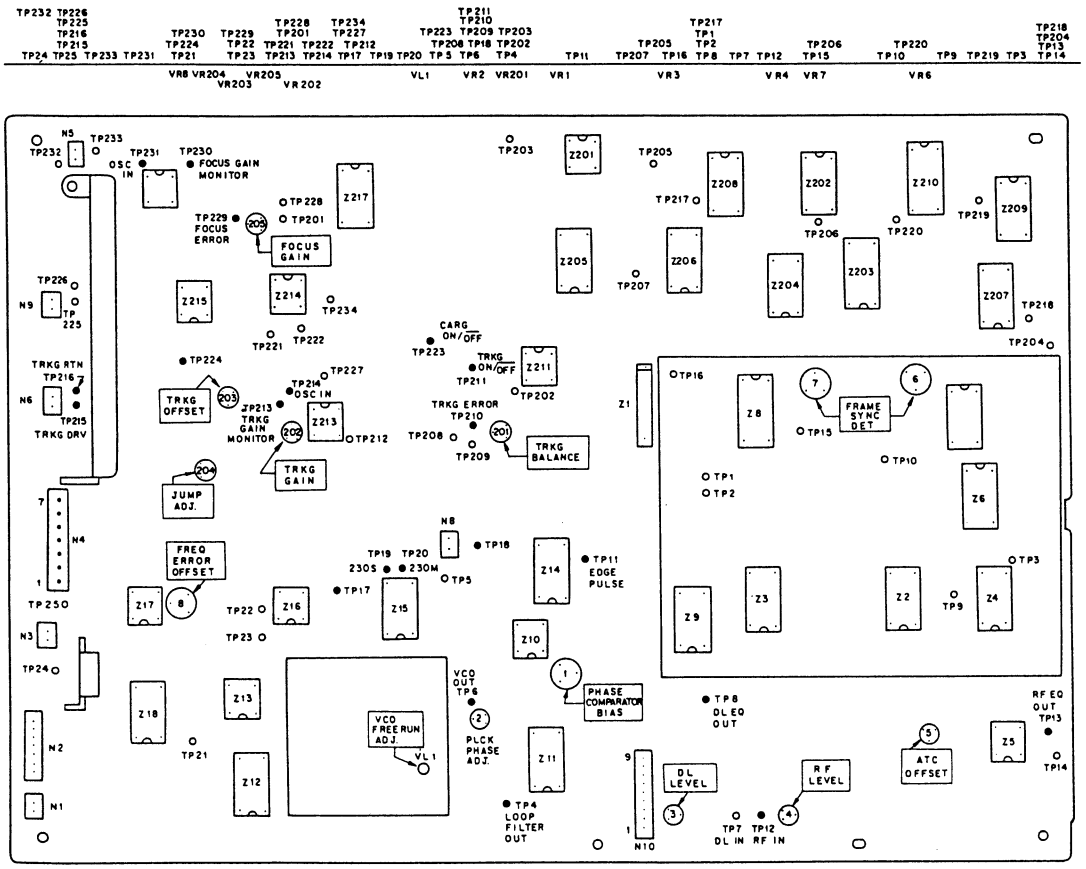


Mechanism section adjustment flowchart

Step No.	Player Mode	Oscilloscope Range		Test Point	Adj. Point	Adjustment Checking Procedure
		CH-1	CH-2			
7	PLAY STOP PLAY, PAUSE				Eccentric cam 7 lock screw 8	INSIDE ADJUSTMENT • Slightly loosen the eccentric cam lock screw 8 so the cam can be adjusted. • Press the play button (START UP) and then press the SKIP + > button to move the slider a little toward the outside of the disc. • Press the stop button to return the slider to the inside of the disc. • Press the play and pause (MUSIC) buttons in that order. • Adjust the eccentric cam 7 so the indicator reading is between 1 min. 0.5 sec. and 1 min. 30 sec. when the indicator begins to advance. • Tighten the eccentric cam lock screw 8 and recheck the cam adjustment. SCREW LOCK • Apply screw lock to the height adjustment bolts 1 , 2 and 3 , each hexagonal attachment screw, the pickup angle adjustment screw 4 and the eccentric cam lock screw 8 .

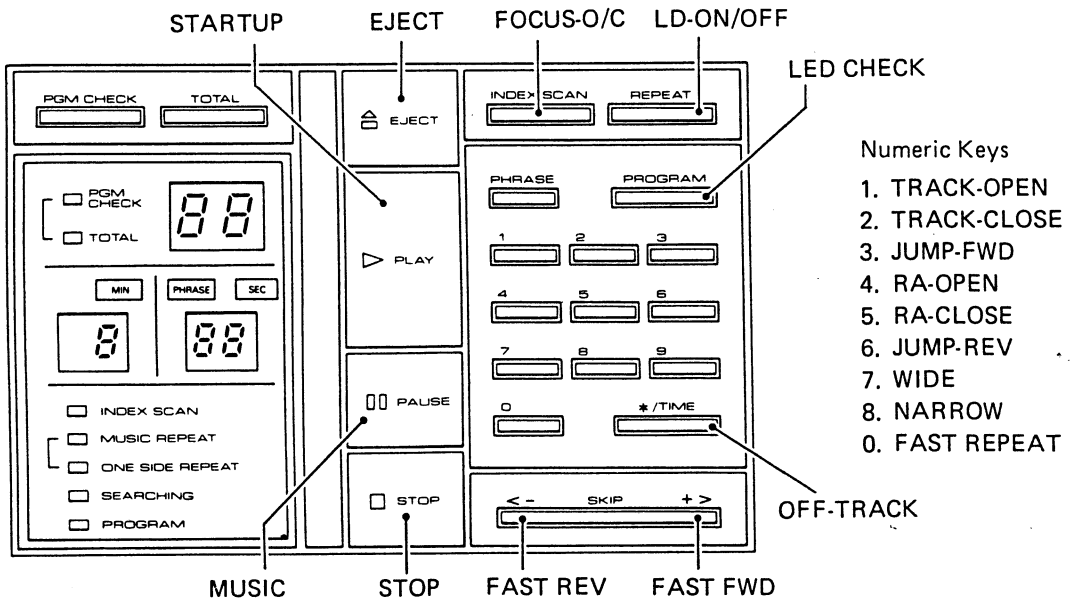
3. ELECTRICAL ADJUSTMENTS

SRVB Adjustment Location

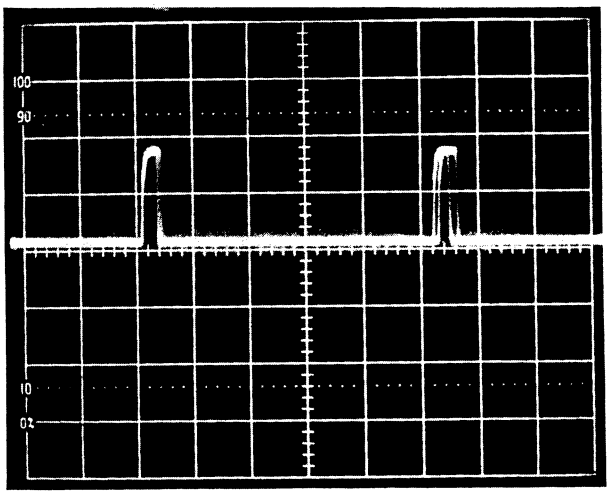
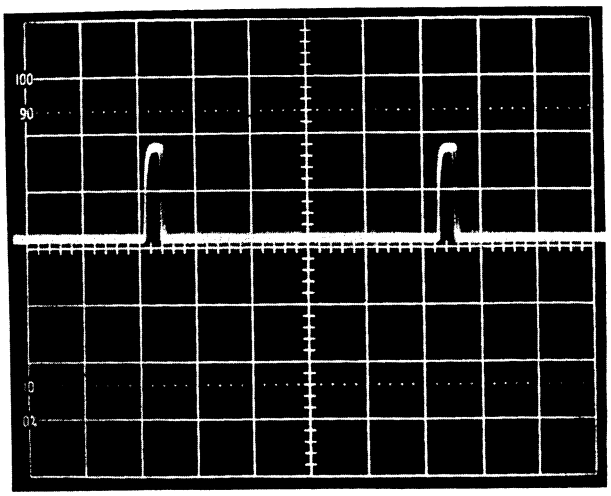


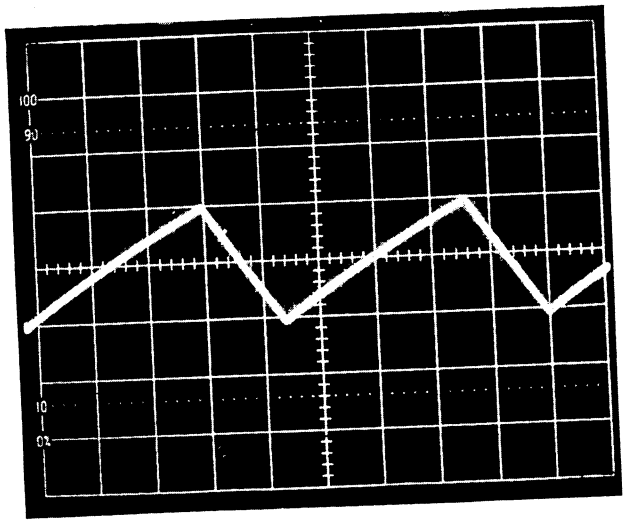
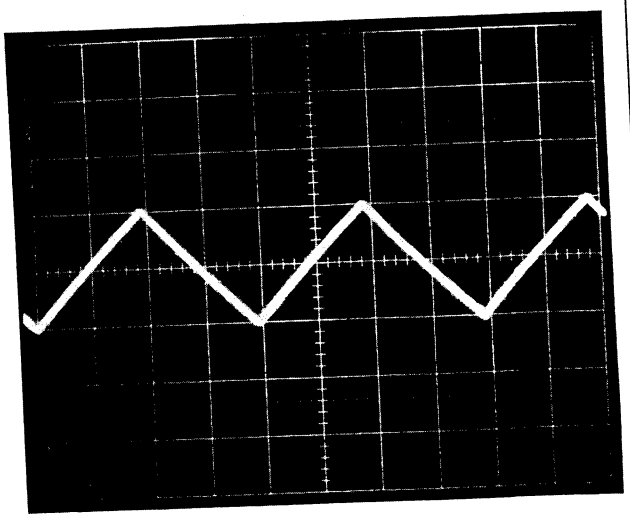
TP NO.	NAME
3	GND
4	LOOP FILTER OUT
5	GND
6	VCO OUT
8	DL EQ OUT
11	EDGE PULSE
12	RF IN
13	RF EQ OUT
17	22T POSITIVE EDGE DET.
18	22T NEGATIVE EDGE DET.
19	230S
20	230M
27	GND
210	TRKG ERROR
211	TRKG ON/OFF
213	TRKG GAIN MONITOR
214	OSC IN
215	TRKG DRIVE
216	TRKG RETURN
223	CARG ON/OFF
224	CARG LOOP MONITOR
229	FOCUS ERROR
230	FOCUS GAIN MONITOR
231	OSC IN

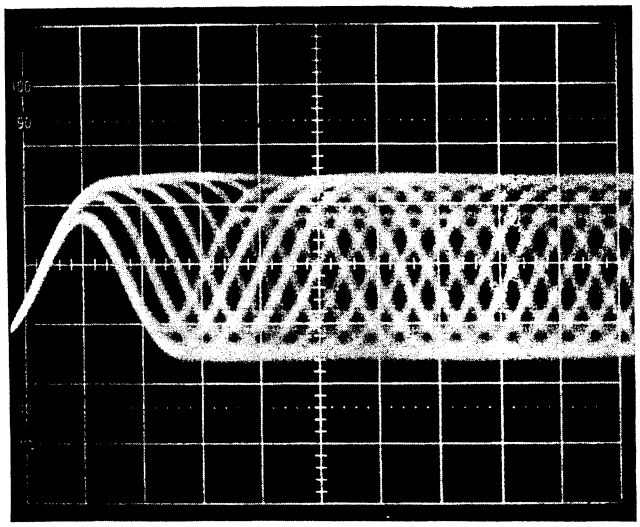
Key Functions at Test Mode

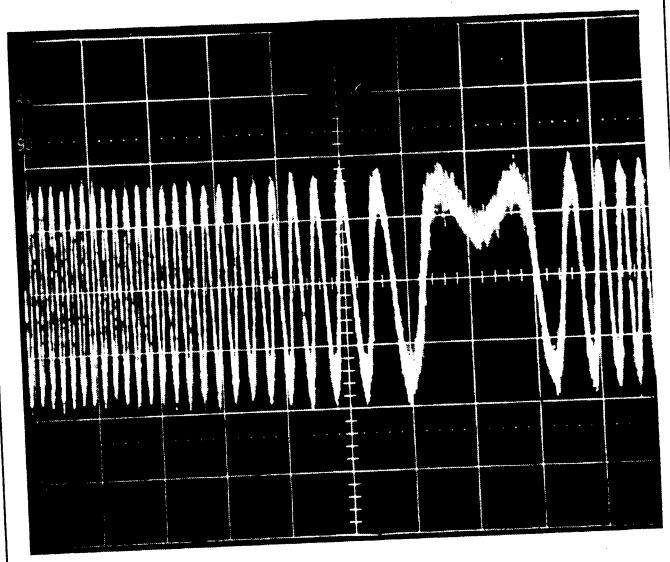
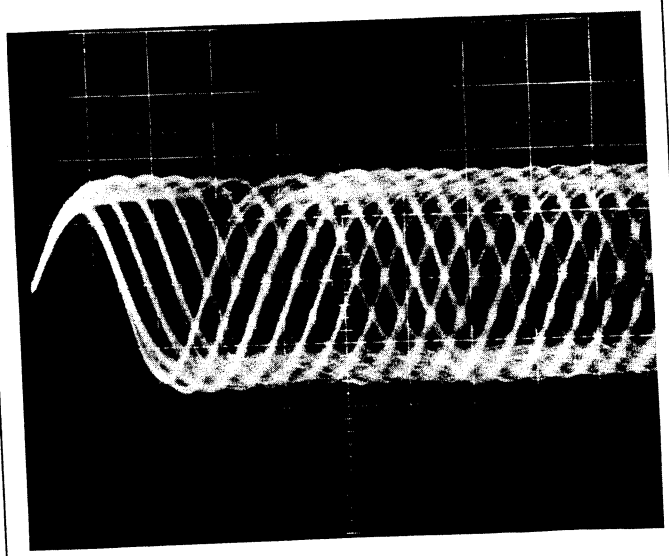


Step No.	Player Mode	Oscilloscope Range		TP No.	Adj. Point	Adjustment Checking Procedure
		V	H			
						MEASUREMENT INSTRUMENTS AND TOOLS • Dual trace oscilloscope with delayed sweep • Light power meter • Test disc (YEDS-3) • Filter for adjustment of FOCUS/TRKG gain • Stereo integrated amplifier and speaker system PRECAUTIONS • All mechanism adjustments must be finished. • 10:1 probes are used in these adjustments. Scope range is shown with the probe in use. • After turning power on, confirm that all motors are not rotating and that the objective lens is retracted inside its holder. • The waveform photo was taken when using a 35MHz band oscilloscope. PREPARATIONS: • Remove the cabinet. • Put the player in the test mode. (Turn power on while pressing the SCON board push switch.)
1	REPEAT				HALC VR201	LASER POWER CHECK • Put the player in the LD ON mode (REPEAT). • Release the beam shutter and check the laser power immediately in front of the objective lens. Standard: 0.3mW ± 0.01mW • Use the HALC VR201 to adjust laser power if necessary. (Refer to step 1 of the mechanism section adjustments.)
2	STOP	10mV/div	1ms/div	SRVB TP-216	SRVB VR203	TRKG LOOP OFFSET ROUGH ADJUSTMENT • Adjust the TRKG returning voltage to 0V.

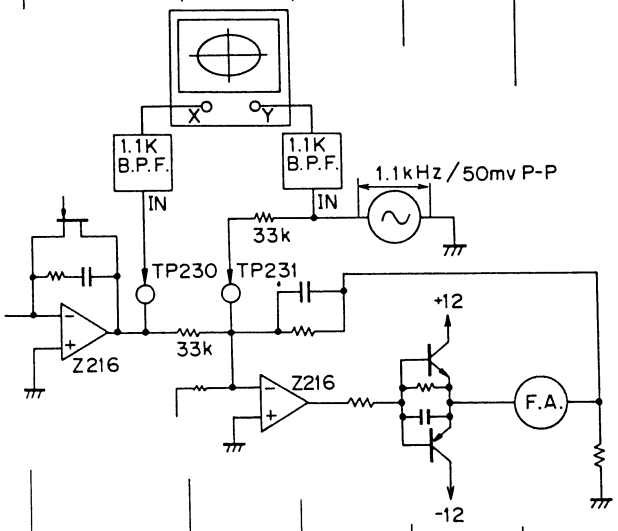
Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
3	STOP INDEX SCAN	0.2V/div	0.5μs/div	SRVB TP-12 TP-11	SRVB VR5	ATC OFFSET ADJUSTMENT • Turn off the power and remove SRVB N10. • Turn the power on while pressing the SCON push switch. (Test mode) • From AFSG, apply a 200kHz, 0.4Vp-p signal to TP-12 and monitor it at TP-11. • Set to the focus on mode (INDEX SCAN). • Adjust VR5 so that jitter is minimized. NG  OK 

Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
4	STOP	500mV/div	0.5μs/div	SRVB TP-6	SRVB VL1	VCO FREE RUN FREQUENCY ADJUSTMENT • Turn off the power, remove the TP-4 side of SRVB R36 with a soldering iron and apply +5.00V to the R36 lead (of the part that was removed). • Turn the power on, connect a frequency counter to TP-6 and adjust to obtain 4.322MHz ± 2kHz at VL1. • Confirm that the VCO oscillator output level of TP-6 is 1.5Vp-p ± 0.5V. • Turn off the power and solder the R36 lead back into place.
5	STOP	0.1V/div	5ms/div	TP-4	SRVB VR-1	PHASE COMPARATOR BIAS ADJUSTMENT • Adjust to obtain a symmetrical triangular wave. NG  OK 

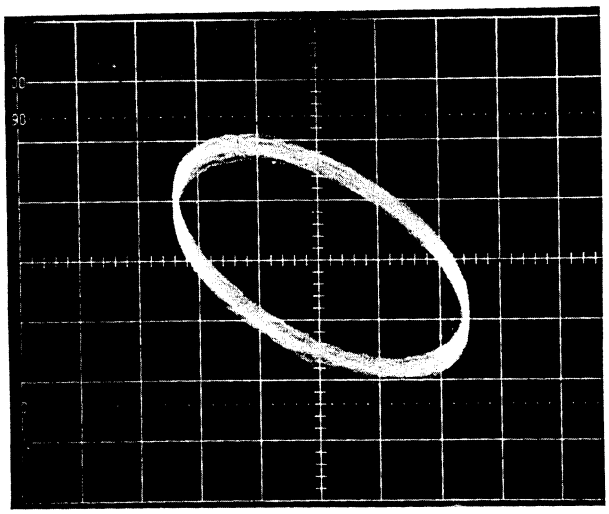
Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
6	PLAY < - SKIP + > PAUSE	50mV/div	0.5μs/div	SRVB TP-12	HALC VR1	FOCUS OFFSET ROUGH ADJUSTMENT • Insert the test disc and close the door. • Put the player in the start up mode (PLAY). Confirm that the music repeat LED (LD ON) and index scan LED (FOCUS ON) light and that the disc begins to rotate. • Press the SKIP + > button (F.F) to advance to the second song and then press the pause button (MUSIC). • If the pickup does not move to the second song, find it with the < - SKIP + > button. Be sure to press the pause button once the pickup has been moved to the second song with the < – SKIP + > Button. *Note: The song number indication appears a few seconds after the pause button is pressed.* • Adjust so the RF level is maximized. 

Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
7	PLAY Numeric 1	0.2V/div	5mS/div	SRVB TP-210	SRVB VR3	TRKG ERROR LEVEL • Set player to TRKG open loop mode (numeric key 1) • Adjust the TRKG error of TP-210 with VR3 (DL gain adjustment) so it is 5.5Vp-p. 
8	Numeric 1	0.2V/div	5ms/div	SRVB TP-210	SRVB VR-201	TRKG BALANCE • Eliminate the DC component in the TRKG error. (Adjust so the TRKG error waveform is centered around 0V.)
9	Numeric 2	0.1V/div	0.5μs/div	SRVB TP-13	SRVB VR4	RF LEVEL • Return the TRKG loop to the closed mode (numeric key 2). • Adjust so the RF signal level is 3.2Vp-p. 

Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
10	PLAY	X-Y		TP-230 (FOCUS GAIN MONITOR) TP-231 (OSCIN)	SRVB VR205	FOCUS GAIN ADJUSTMENT • Connect the gain adjustment tool, AF oscillator and oscilloscope as shown below. • Adjust so the AF oscilloscope output is 1.1kHz, 50mVp-p. • Set the oscilloscope to the X-Y mode and adjust VR205 so the lissajous waveform is a horizontal oval.



NG



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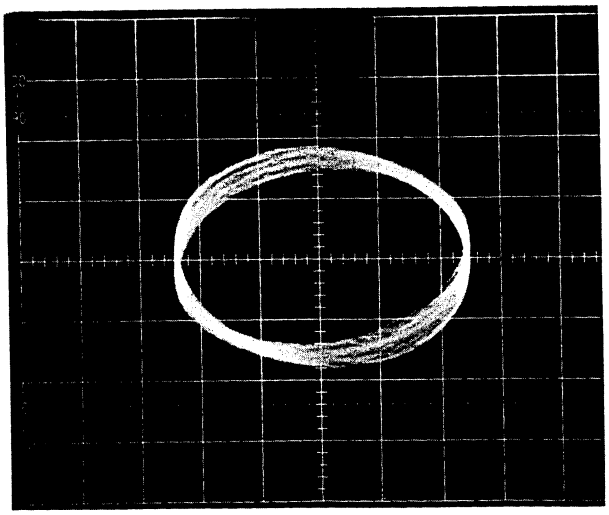
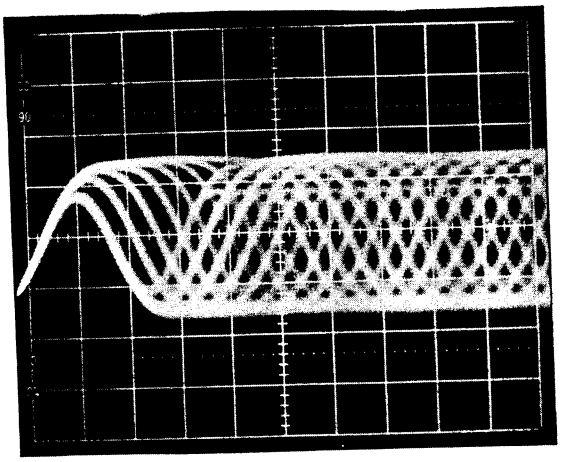
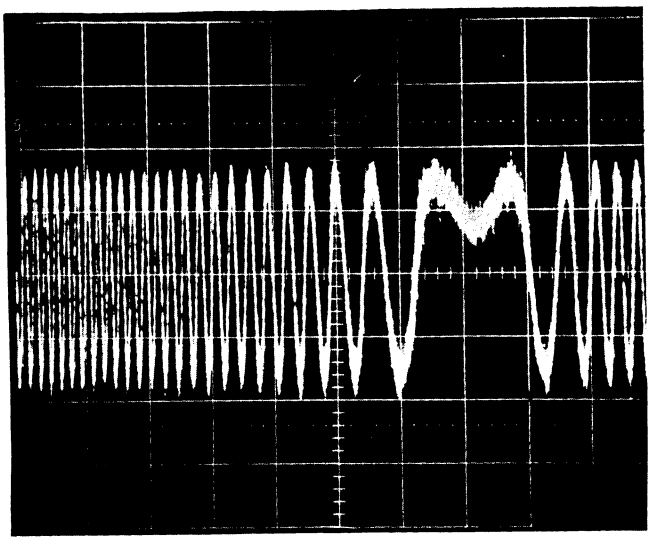
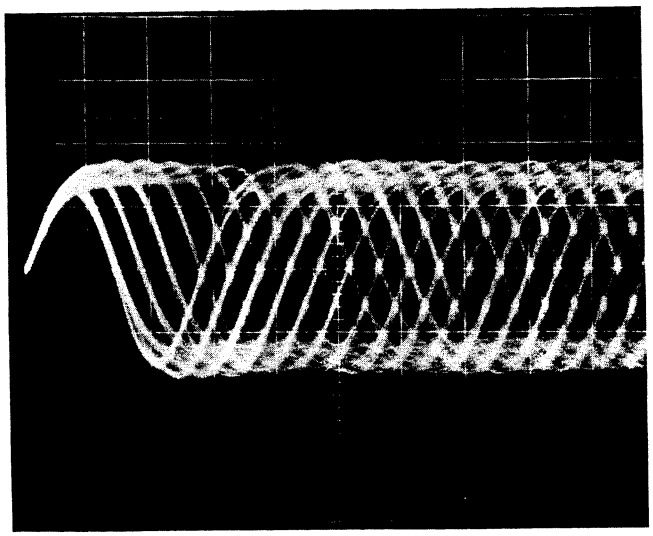
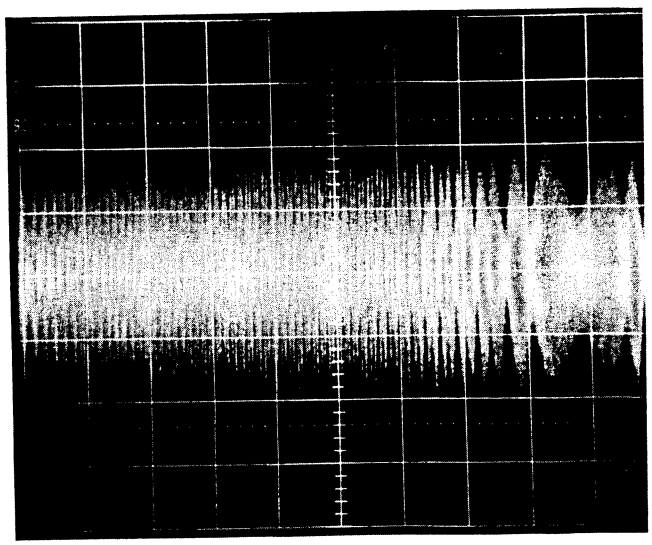
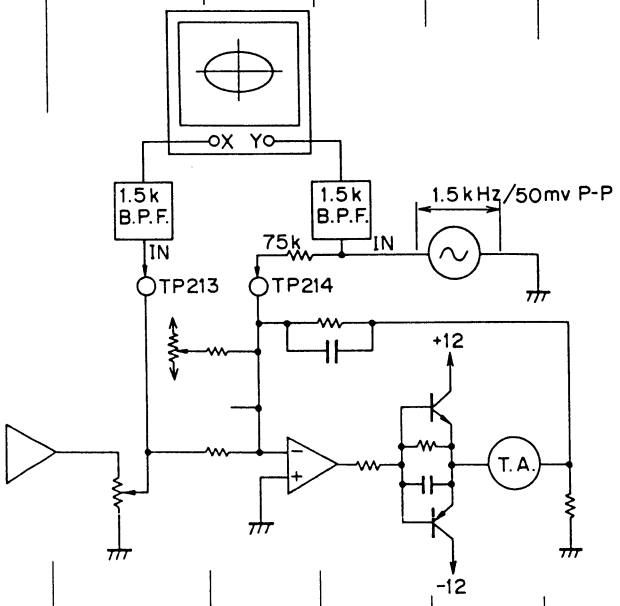


Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
11	PLAY	0.2V/div	0.5μs/div	SRVB TP-12	HALC VR1	FOCUS OFFSET FINE ADJUSTMENT • Adjust so the eye pattern is as sharp as possible. 
	STOP	5mV/div	5ms/div	SRVB TP-229	HALC VR1	• Press the stop button and read the DC voltage V_O of TP-229. • Turn the HALC VR1 so the DC voltage of TP-229 is V_O -50mV.

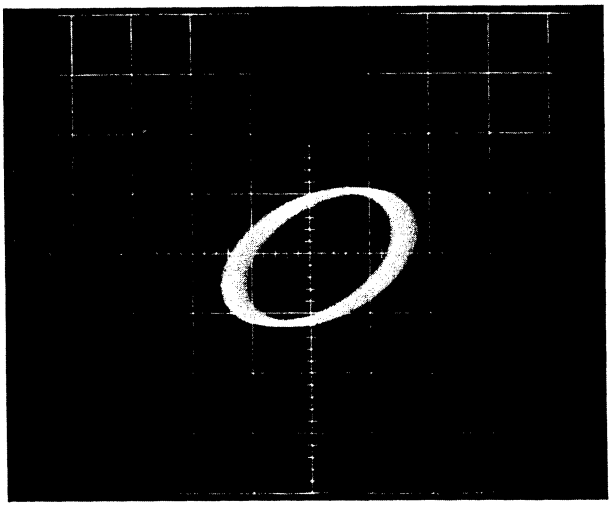
Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
12	PLAY SKIP + > PAUSE Numeric 1 Numeric 2	0.2V/div	5ms/div	SRVB TP-210 TP-210	SRVB VR3 SRVB VR201	TRKG ERROR LEVEL AND TRKG BALANCE FINE ADJUSTMENT • Put the player in the start up mode (press play button). • Press the SKIP + > button to move the slider to the outside of the disc. Then put the player in the music mode (pause). • Use the SKIP + > and pause buttons to move to a point between the 0 and 2 min. section of the second song. • Put the player in the TRKG OPEN mode (numeric key 1). • Adjust the TRKG error level to 5.5Vp-p. • Adjust VR201 to eliminate the DC component in the TRKG error (so the TRKG error waveform is centered around 0V). • When the adjustments are completed, press numeric key 2 (TRKG CLOSE). 

Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
13	PLAY Numeric 2	0.1V/div	0.5μs/div	SRVB TP-13	SRVB VR4	RF LEVEL ADJUSTMENT • Put the player in the TRKG close mode (numeric key 2). • Adjust the RF level to 3.2Vp-p. 
14	PLAY Numeric 1	20mV/div	5ms/div	SRVB TP-8		DL SIGNAL LEVEL CHECK • At a point between 0 and 2 min. of the second song, put the unit in the TRKG open mode (numeric key 1) and AC couple the oscilloscope. • Confirm that the DL signal level is 0.65~0.8Vp-p. 

Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
15	PLAY	X-Y X: 10mV/div Y: 20mV/div		SRVB TP-214 TP-213	SRVB VR202	TRKG GAIN ADJUSTMENT • Connect the gain adjustment tool, AF oscillator and oscilloscope as shown below. • Adjust so the AF oscilloscope output is 1.5kHz, 0.1Vp-p. • Set the oscilloscope to the X-Y mode and adjust VR202 so the lissajous waveform is a horizontal oval.



NG



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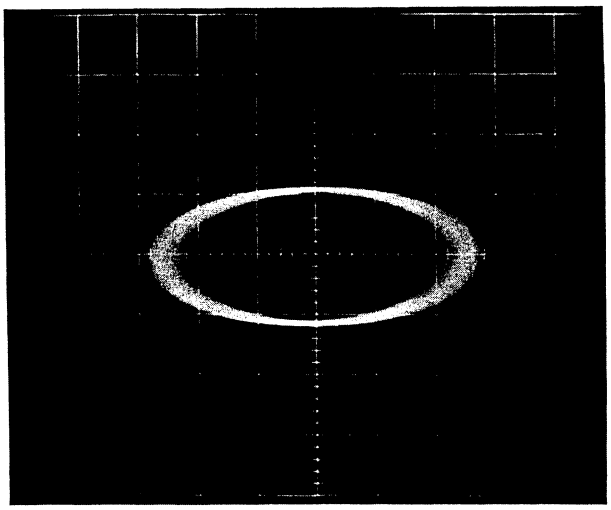
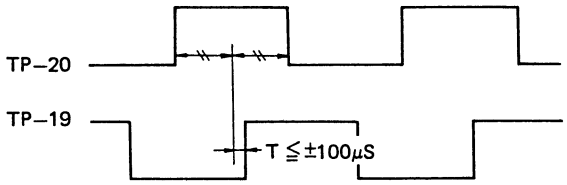
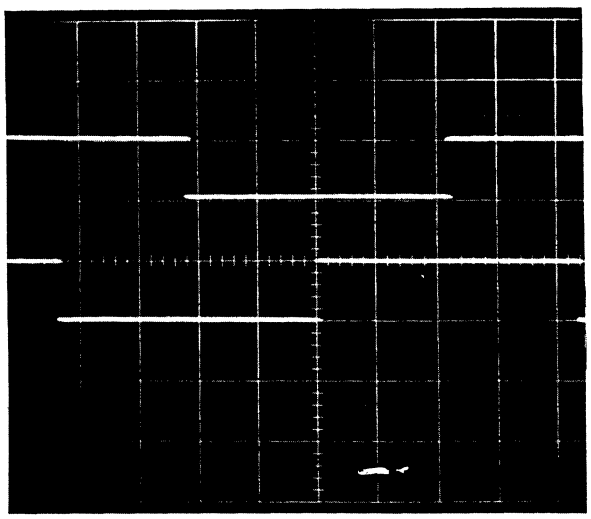
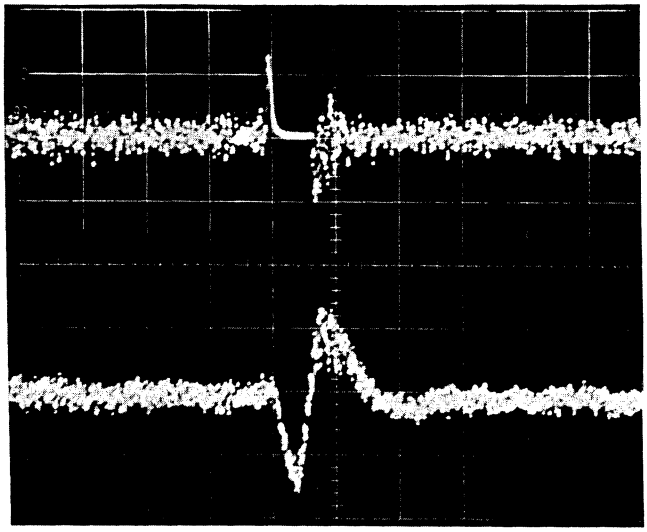
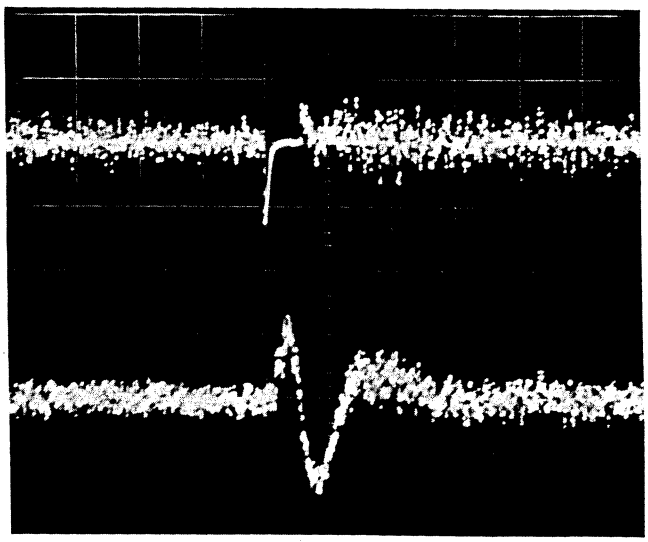


Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
16						SYNC SERVO CHECK • Confirm that the TP4 voltage V_1 is 5 ± 0.4V.
	PLAY	0.5V/div	0.1ms/div	SRVB TP-4		
	PAUSE	0.5V/div	0.1ms/div	TP-4		• Put the unit in the music mode (PAUSE) and confirm that the TP4 voltage V_2 is 5 ± 0.1V. • Confirm that $\lvert V_1 - V_2 \rvert < 0.4V$.
						Perform the following procedure only when the absolute value of $V_1 - V_2$ is not less than 0.4V. • Turn off the power and remove N10, N11 and N3 from SRVB. • Connect N11-4 (SYNC) to N4-1 (+5V). • Put the player in the test mode. • Connect the oscilloscope to TP-13, send a 196.445kHz sine wave from SG to TP-12 and adjust the oscillator so the signal at TP-13 is about 2.4Vp-p. During the adjustment, continuously check the SG output frequency with a frequency counter.
		0.1V/div	5μs/div	SRV13 TP-13 TP-12		
	INDEX SCAN	0.2V/div	0.5μs/div	TP-17	VR7	• Put the player in the focus on mode (press index scan). • While observing the waveform, turn VR7 counterclockwise so that TP-17 is almost at the level (0~10% of the H level).
		0.2V/div	0.5μs/div	TP-18	VR6	• While observing the waveform, turn VR6 counterclockwise so that TP-18 is almost at the level (0~10% of the H level). • Turn off the power and reconnect the connector as it was originally. Then check the SYNC servo again.

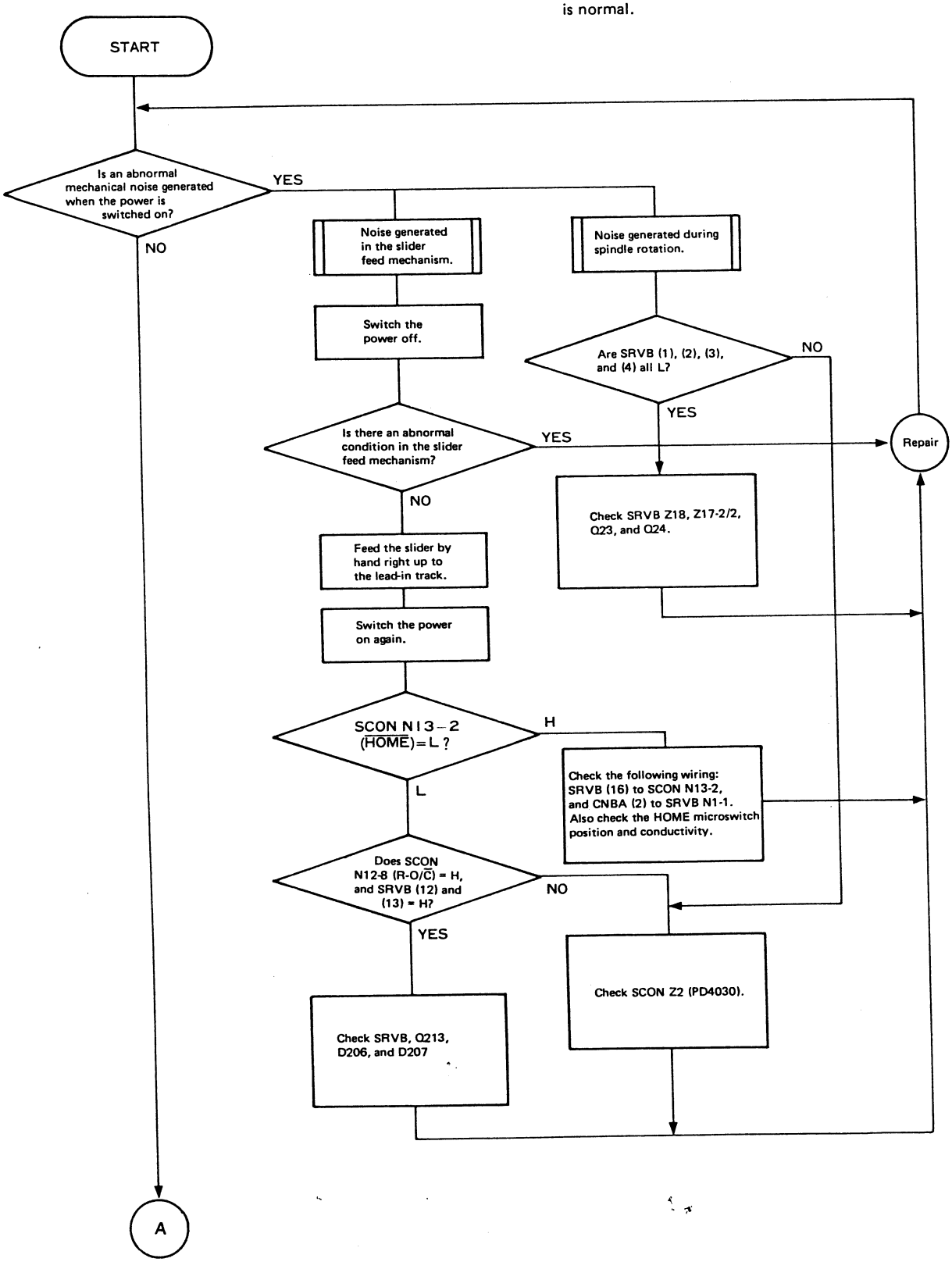
Step. No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
17	PLAY PAUSE	0.5V/div 0.5V/div	0.5ms/div	SRVB TP-20 TP-19	SRVB VR8	QUARTZ SERVO CHECK • Set the oscilloscope to the chop mode.  • Trigger the oscilloscope by the 230M signal of TP-20 and read the deviation T including the jitter of TP-19. • T must not exceed ±100μs. • If T is not within the standard, adjust VR8. TP-20 

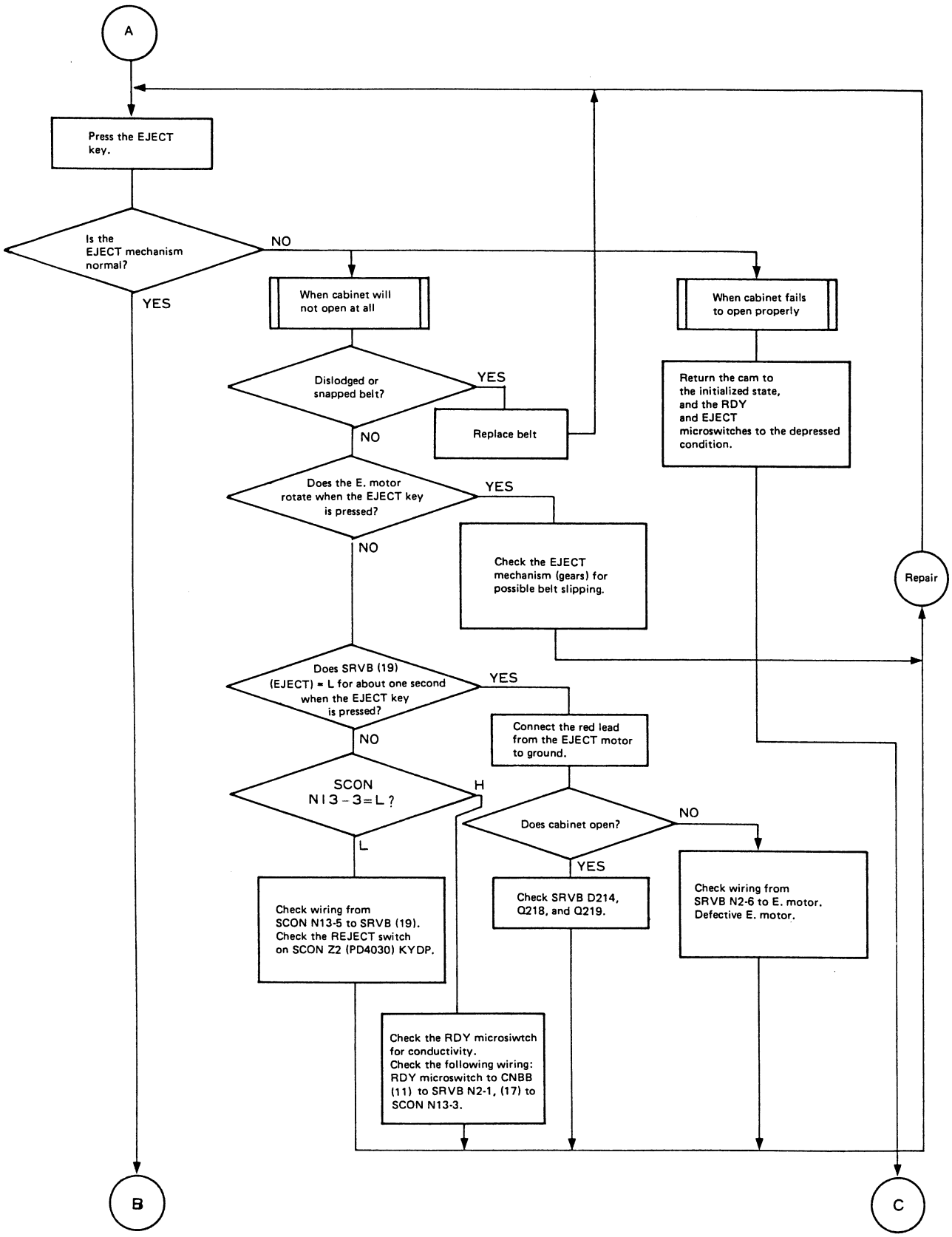
Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
18	PLAY Numeric 3	0.5V/div	0.5ms/div	SRVB TP-215	SRVB VR204	JUMP ADJUSTMENT • Adjust VR204 so the peak of the jump waveform at the TRKG driving (TP-215) terminal is 7V ± 1V when jumping forward (numeric key 3 pressed). • Confirm that the overshoot after jumping is not more than half of the peak value during the jump based on the TRKG error of TP-210.
		0.2V/div		TP-210		
	Numeric 6	0.5V/div	0.5ms/div	TP-215		• Confirm that the peak of the jump waveform at the TRKG driving (TP-215) terminal is -7V ± 1V during reverse jumping (numeric key 6 pressed). • Confirm that the overshoot after jumping is not more than half of the peak value during the jump based on the TRKG error of TP-210.
		0.2V/div		TP-210		

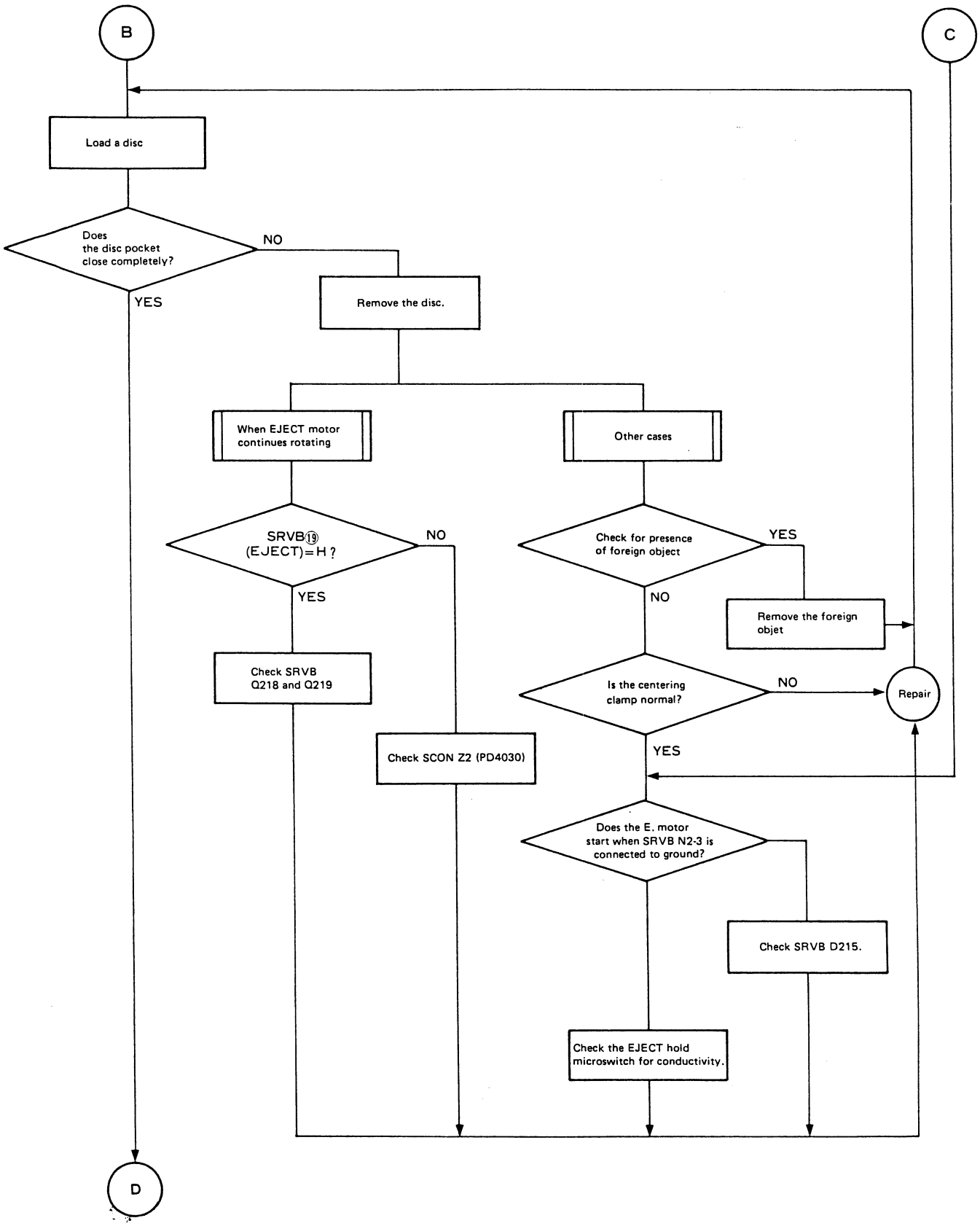
Step No.	Player Mode	Oscilloscope Range V	Oscilloscope Range H	TP No.	Adj. Point	Adjustment Checking Procedure
19	STOP	5mV/div	1ms/div	SRVB TP-223 TP-211 TP-224	SRVB VR203	TRKG OFFSET FINE ADJUSTMENT • Press the stop button. • Connect TP-223 and TP-211 with the short clip. • Monitor TP-224 and adjust VR204 so it becomes 0V. • Remove the short clip.
20	PLAY PAUSE STOP PLAY PAUSE					INSIDE LIMIT LOCATION CHECK • After start up (play), put the player in the music mode (pause). • Press the stop button to return the slider to the inside of the disc. • Press the play and pause buttons in that order. • Confirm that the reading is between 1 min. 0.5 sec. and 1 min. 30 sec. when the indicator begins to advance. • If the reading is not between those times, perform step 7 of the mechanism adjustments.

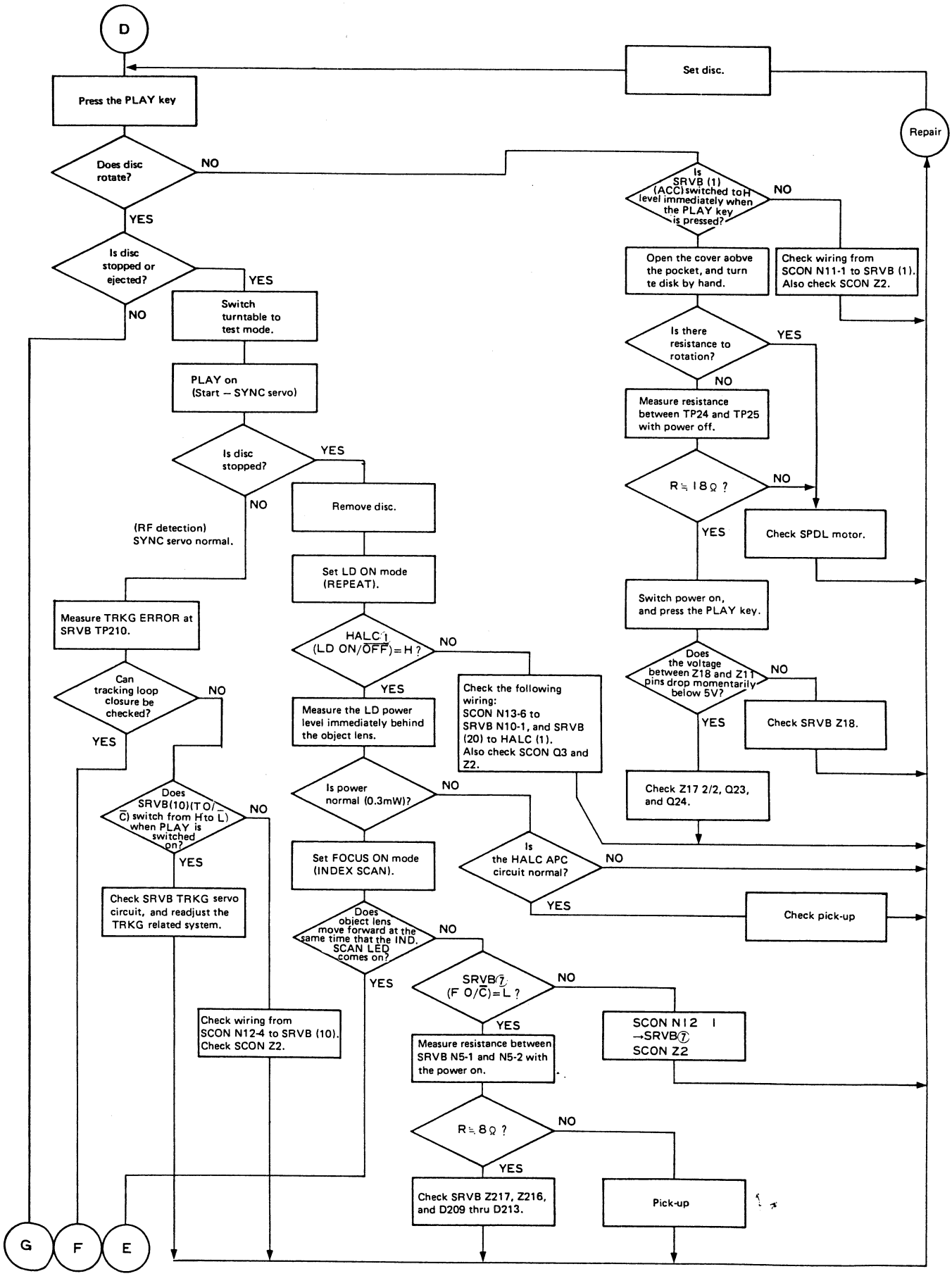
4. TROUBLESHOOTING

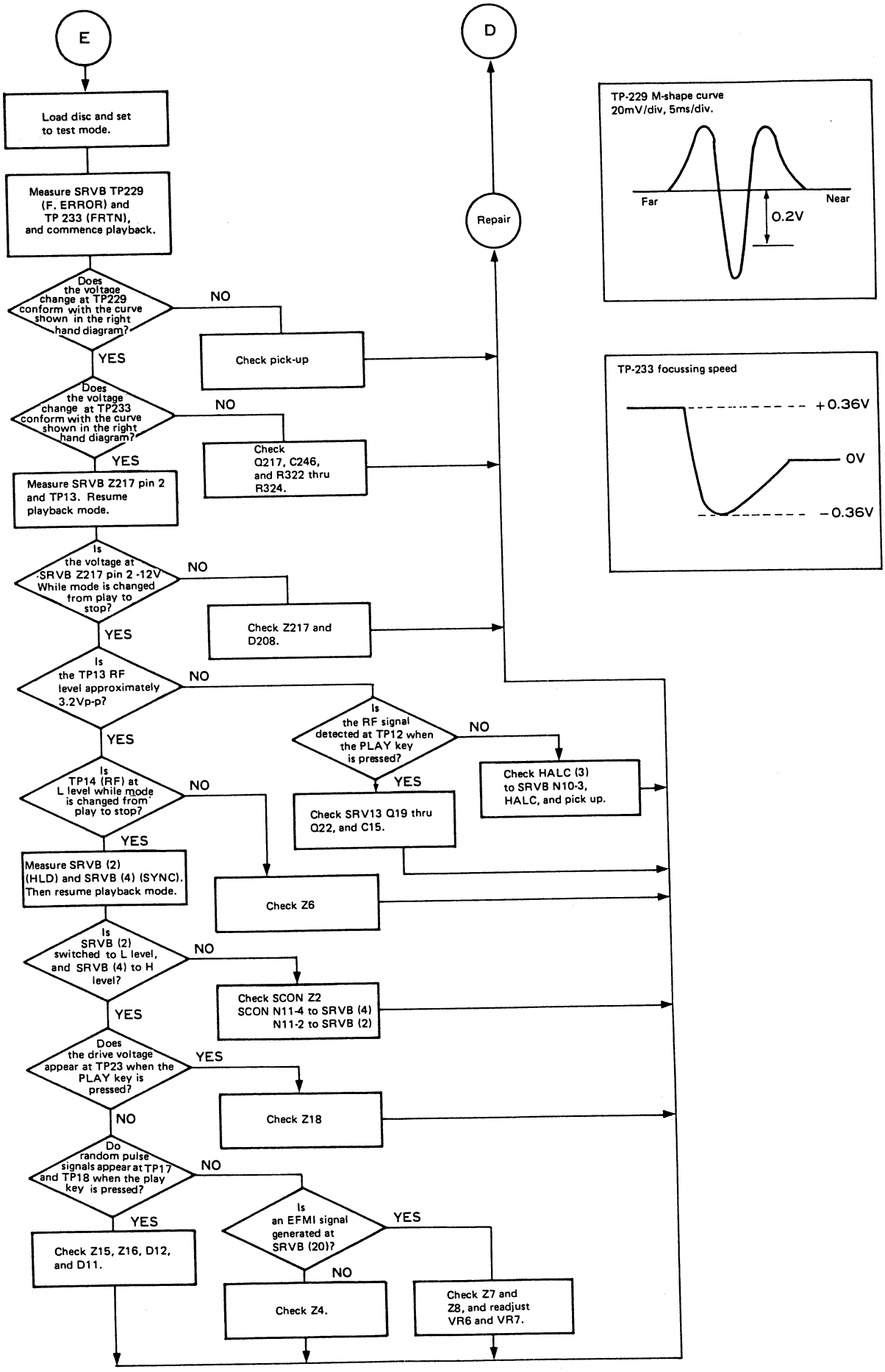
Note: •First check that the displayer power supply system is normal.
•Make sure that the compact disc employed is normal.

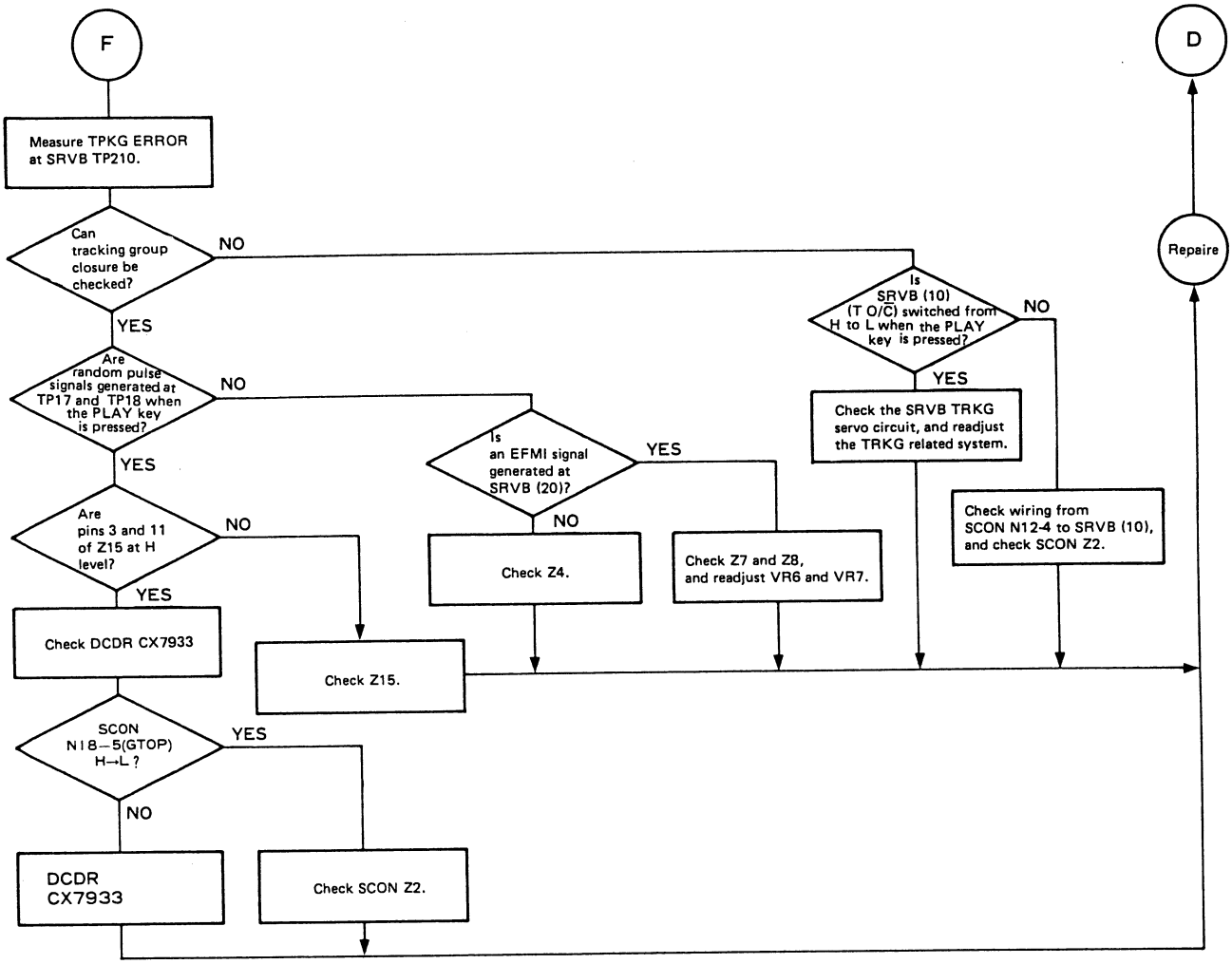


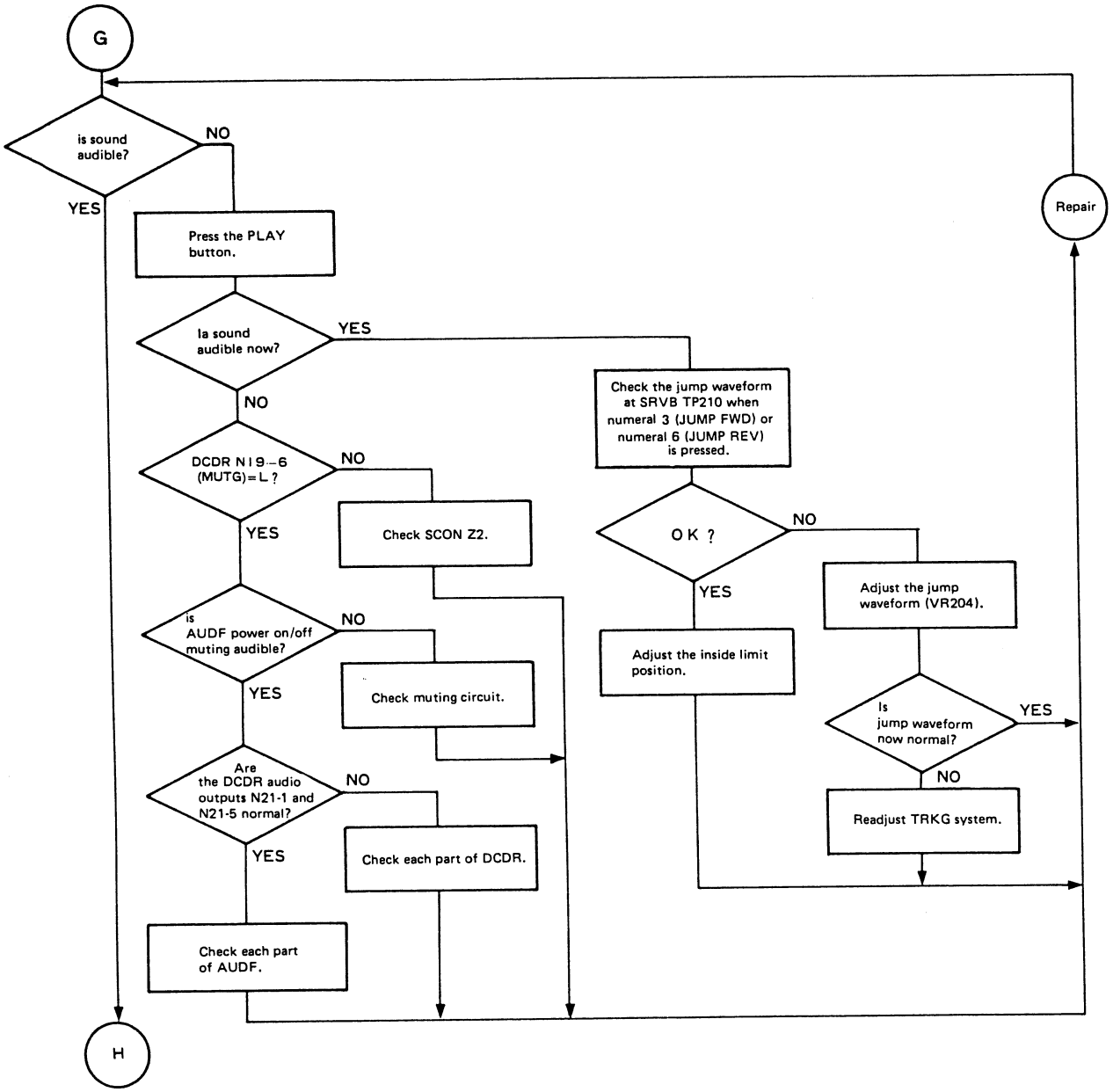

A
Press the EJECT key.
Is the EJECT mechanism normal?
NO
YES
When cabinet will not open at all
When cabinet fails to open properly
Dislodged or snapped belt?
YES
Replace belt
NO
Return the cam to the initialized state, and the RDY and EJECT microswitches to the depressed condition.
Does the E. motor rotate when the EJECT key is pressed?
YES
NO
Check the EJECT mechanism (gears) for possible belt slipping.
Repair
Does SRVB (19) (EJECT) = L for about one second when the EJECT key is pressed?
YES
NO
Connect the red lead from the EJECT motor to ground.
SCON N13-3=L?
H
L
Does cabinet open?
NO
YES
Check wiring from SCON N13-5 to SRVB (19). Check the REJECT switch on SCON Z2 (PD4030) KYDP.
Check SRVB D214, Q218, and Q219.
Check wiring from SRVB N2-6 to E. motor. Defective E. motor.
Check the RDY microsiwtch for conductivity. Check the following wiring: RDY microswitch to CNBB (11) to SRVB N2-1, (17) to SCON N13-3.
B
C

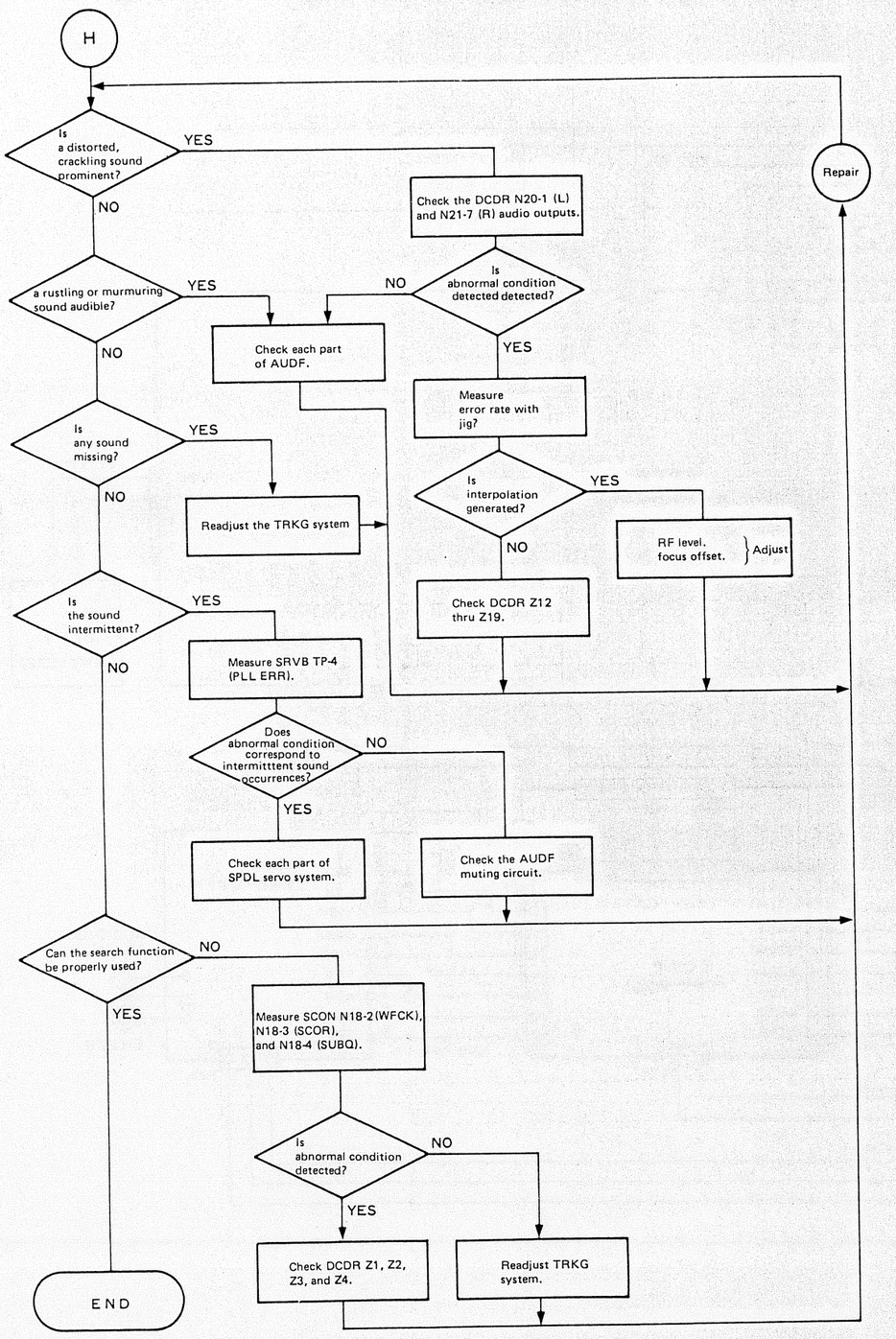

B
C
Load a disc
Does the disc pocket close completely?
NO
YES
Remove the disc.
When EJECT motor continues rotating
Other cases
SRVB⑲ (EJECT)=H ?
NO
YES
Check for presence of foreign object
YES
NO
Remove the foreign objet
Check SRVB Q218 and Q219
Is the centering clamp normal?
NO
Repair
Check SCON Z2 (PD4030)
YES
Does the E. motor start when SRVB N2-3 is connected to ground?
Check SRVB D215.
Check the EJECT hold microswitch for conductivity.
D


D
Set disc.
Press the PLAY key
Repair
Does disc rotate?
NO
YES
Is SRVB (1) (ACC) switched to H level immediately when the PLAY key is pressed?
NO
Open the cover aobve the pocket, and turn te disk by hand.
Check wiring from SCON N11-1 to SRVB (1). Also check SCON Z2.
Is there resistance to rotation?
YES
NO
Measure resistance between TP24 and TP25 with power off.
R ≒ 18Ω ?
NO
YES
Check SPDL motor.
Switch power on, and press the PLAY key.
Does the voltage between Z18 and Z11 pins drop momentarily below 5V?
NO
YES
Check SRVB Z18.
Check Z17 2/2, Q23, and Q24.
Is disc stopped or ejected?
YES
NO
Switch turntable to test mode.
PLAY on (Start – SYNC servo)
Is disc stopped?
YES
NO
Remove disc.
(RF detection) SYNC servo normal.
Set LD ON mode (REPEAT).
HALC (1) (LD ON/OFF) = H ?
NO
YES
Check the following wiring:
SCON N13-6 to SRVB N10-1, and SRVB (20) to HALC (1).
Also check SCON Q3 and Z2.
Measure the LD power level immediately behind the object lens.
Is power normal (0.3mW)?
NO
YES
Is the HALC APC circuit normal?
NO
YES
Check pick-up
Measure TRKG ERROR at SRVB TP210.
Can tracking loop closure be checked?
NO
YES
Does SRVB(10)(T 0/C) switch from H to L) when PLAY is switched on?
NO
YES
Check SRVB TRKG servo circuit, and readjust the TRKG related system.
Check wiring from SCON N12-4 to SRVB (10). Check SCON Z2.
Set FOCUS ON mode (INDEX SCAN).
Does object lens move forward at the same time that the IND. SCAN LED comes on?
NO
YES
SRVB (7) (F 0/C) = L ?
NO
YES
SCON N12 1 →SRVB (7) SCON Z2
Measure resistance between SRVB N5-1 and N5-2 with the power on.
R ≒ 8Ω ?
NO
YES
Check SRVB Z217, Z216, and D209 thru D213.
Pick-up
G
F
E


E
Load disc and set to test mode.
Measure SRVB TP229 (F. ERROR) and TP 233 (FRTN), and commence playback.
Does the voltage change at TP229 conform with the curve shown in the right hand diagram?
NO
YES
Check pick-up
Does the voltage change at TP233 conform with the curve shown in the right hand diagram?
NO
YES
Check Q217, C246, and R322 thru R324.
Measure SRVB Z217 pin 2 and TP13. Resume playback mode.
Is the voltage at SRVB Z217 pin 2 -12V While mode is changed from play to stop?
NO
YES
Check Z217 and D208.
Is the TP13 RF level approximately 3.2Vp-p?
NO
YES
Is the RF signal detected at TP12 when the PLAY key is pressed?
NO
YES
Check HALC (3) to SRVB N10-3, HALC, and pick up.
Check SRV13 Q19 thru Q22, and C15.
Is TP14 (RF) at L level while mode is changed from play to stop?
NO
YES
Measure SRVB (2) (HLD) and SRVB (4) (SYNC). Then resume playback mode.
Check Z6
Is SRVB (2) switched to L level, and SRVB (4) to H level?
NO
YES
Check SCON Z2
SCON N11-4 to SRVB (4)
N11-2 to SRVB (2)
Does the drive voltage appear at TP23 when the PLAY key is pressed?
YES
NO
Check Z18
Do random pulse signals appear at TP17 and TP18 when the play key is pressed?
NO
YES
Check Z15, Z16, D12, and D11.
Is an EFMI signal generated at SRVB (20)?
YES
NO
Check Z4.
Check Z7 and Z8, and readjust VR6 and VR7.
D
Repair
TP-229 M-shape curve
20mV/div, 5ms/div.
Far
Near
0.2V
TP-233 focussing speed
+0.36V
0V
-0.36V

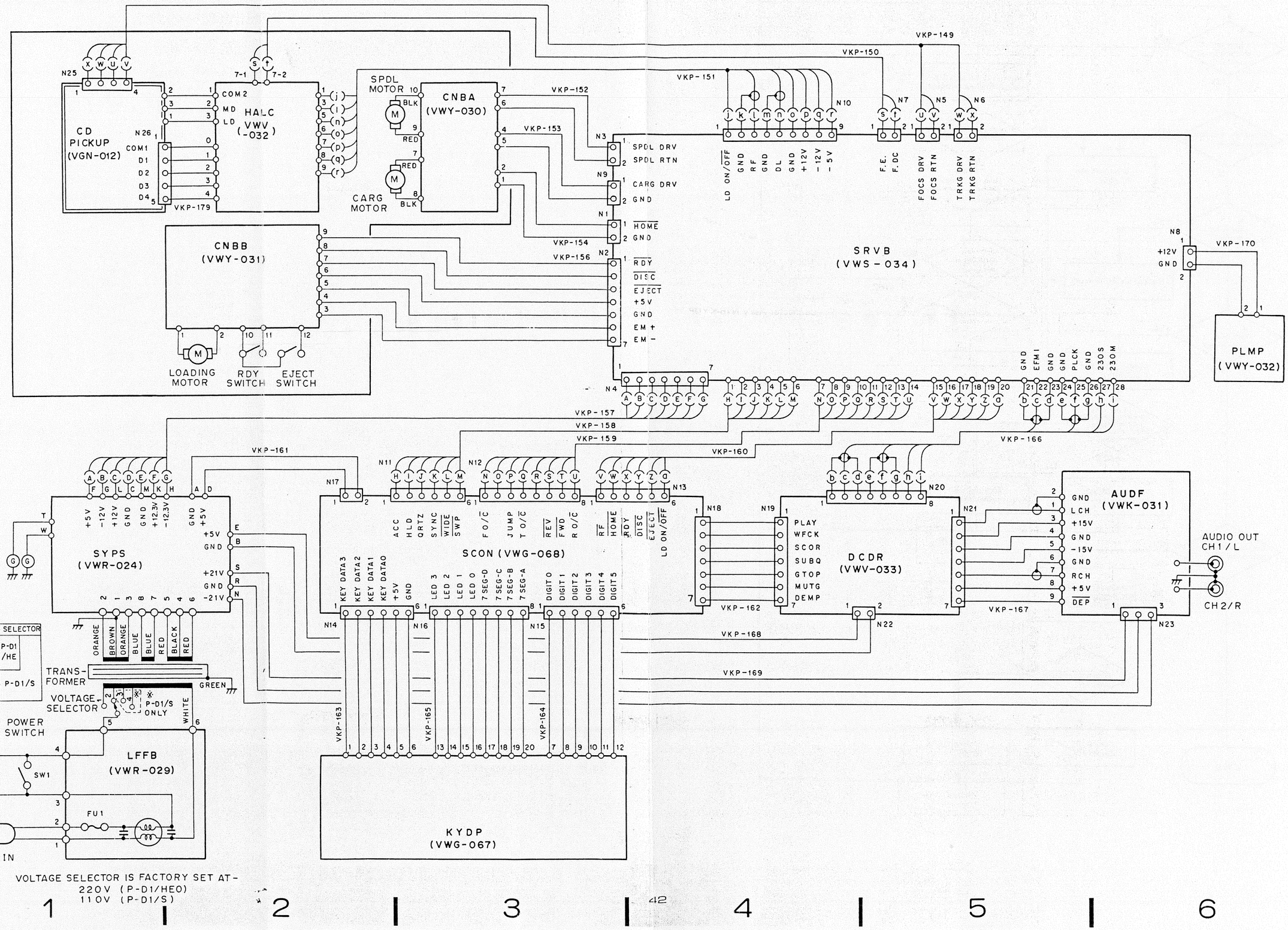

F
Measure TPKG ERROR at SRVB TP210.
Can tracking group closure be checked?
NO
YES
Are random pulse signals generated at TP17 and TP18 when the PLAY key is pressed?
NO
YES
Are pins 3 and 11 of Z15 at H level?
NO
YES
Check DCDR CX7933
SCON N18–5(GTOP) H→L ?
YES
NO
DCDR CX7933
Check SCON Z2.
Check Z15.
Is an EFMI signal generated at SRVB (20)?
YES
NO
Check Z4.
Check Z7 and Z8, and readjust VR6 and VR7.
Is SRVB (10) (T O/C) switched from H to L when the PLAY key is pressed?
NO
YES
Check the SRVB TRKG servo circuit, and readjust the TRKG related system.
Check wiring from SCON N12-4 to SRVB (10), and check SCON Z2.
D
Repaire


G
is sound audible?
NO
YES
Press the PLAY button.
Is sound audible now?
YES
NO
DCDR N19-6 (MUTG)=L ?
NO
YES
Check SCON Z2.
is AUDF power on/off muting audible?
NO
YES
Check muting circuit.
Are the DCDR audio outputs N21-1 and N21-5 normal?
NO
YES
Check each part of DCDR.
Check each part of AUDF.
H
Check the jump waveform at SRVB TP210 when numeral 3 (JUMP FWD) or numeral 6 (JUMP REV) is pressed.
O K ?
NO
YES
Adjust the jump waveform (VR204).
Adjust the inside limit position.
Is jump waveform now normal?
YES
NO
Readjust TRKG system.
Repair


H
Is a distorted, crackling sound prominent?
YES
NO
Check the DCDR N20-1 (L) and N21-7 (R) audio outputs.
Repair
a rustling or murmuring sound audible?
YES
NO
Is abnormal condition detected detected?
NO
YES
Check each part of AUDF.
Measure error rate with jig?
Is any sound missing?
YES
NO
Is interpolation generated?
YES
NO
Readjust the TRKG system
RF level, focus offset.
Adjust
Check DCDR Z12 thru Z19.
Is the sound intermittent?
YES
NO
Measure SRVB TP-4 (PLL ERR).
Does abnormal condition correspond to intermitttent sound occurrences?
NO
YES
Check each part of SPDL servo system.
Check the AUDF muting circuit.
Can the search function be properly used?
NO
YES
Measure SCON N18-2 (WFCK), N18-3 (SCOR), and N18-4 (SUBQ).
Is abnormal condition detected?
NO
YES
Check DCDR Z1, Z2, Z3, and Z4.
Readjust TRKG system.
END

5. SCHEMATIC DIAGRAM, PCB PATTERNS, & PARTS LIST

5-1 OVERALL CONNECTIONS DIAGRAM



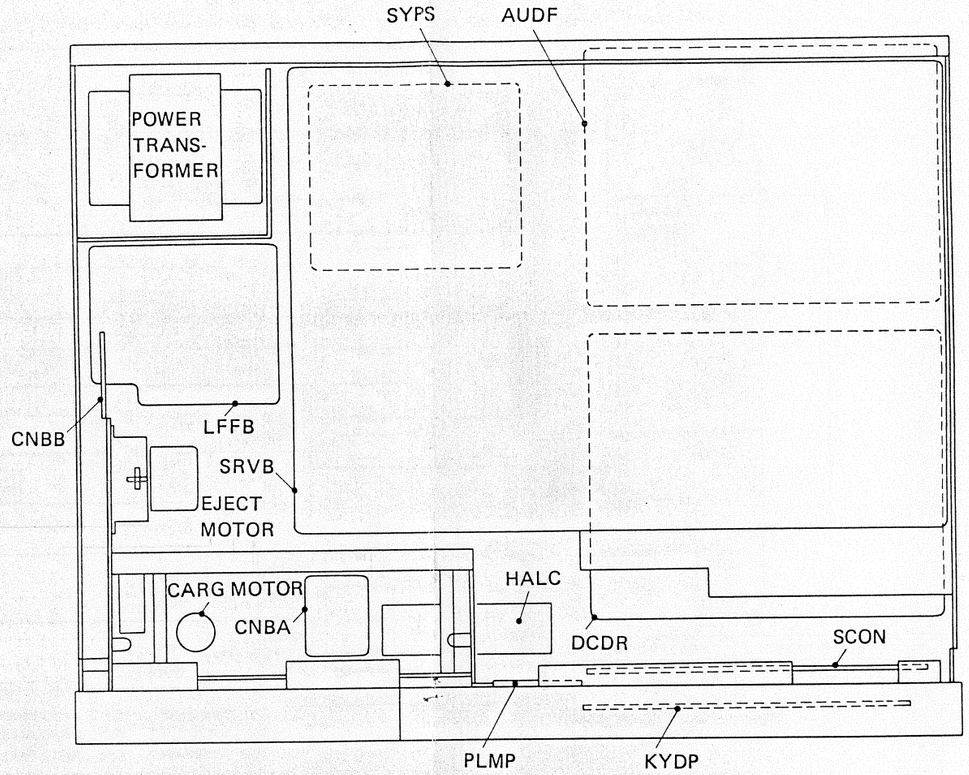
MISCELLANEOUS PARTS LIST

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the symbols ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model No., temperature, humidity, etc.

Parts List

Mark	Part No.	Symbol & Description
	VWR-024	SYPS
⚠	VWR-029	LFFB
	VWV-032	HALC
	VWS-034	SRVB
	VWV-033	DCDR
	VWK-001	AUDF
	VWG-068	SCON
	VWG-067	KYDP
	VWY-030	CNBA
	VWY-031	CNBB
	VWY-032	PLMP
	VGN-012	Pickup
⚠	VTT-024	Power Transformer (HE model)
⚠	VTT-030	Power Transformer (S model)
	VXM-022	Spindle motor
	VXM-023	Carriage motor
	VXX-117	Eject motor
⚠	VSA-006	SW1 Power switch (HE/S model)
⚠	VSF-009	SW2, SW3
⚠	VCG-018	C1
⚠	VEK-012	FU1 Fuse 250V/250mA (HE model)
⚠	VEK-013	FU1 Fuse 250V/800mA (S model)
⚠	VDG-011	Power cord (HE model)
⚠	VDG-013	Power cord (S model)
	VKP-149	Connector Ass'y N5, N6-HALC
	VKP-150	Connector Ass'y N7-HALC
	VKP-151	Connector Ass'y N10-HALC
	VKP-152	Connector Ass'y N3-CNBA
	VKP-153	Connector Ass'y N9-CNBA
	VKP-154	Connector Ass'y N1-CNBA
	VKP-156	Connector Ass'y N2-CNBB
	VKP-157	Connector Ass'y N4-SYPS
	VKP-158	Connector Ass'y N11-SRVB
	VKP-159	Connector Ass'y N12-SRVB
	VKP-160	Connector Ass'y N13-SRVB
	VKP-161	Connector Ass'y N17-SYPS
	VKP-162	Connector Ass'y N18-N19
	VKP-163	Connector Ass'y N14-KYDP
	VKP-164	Connector Ass'y N15-KYDP
	VKP-165	Connector Ass'y N16-KYDP
	VKP-166	Connector Ass'y N20-SRVB
	VKP-167	Connector Ass'y N21-AUDF
	VKP-168	Connector Ass'y N22-SYPS
	VKP-169	Connector Ass'y N23-SYPS
	VKP-170	Connector Ass'y N8-PLMP

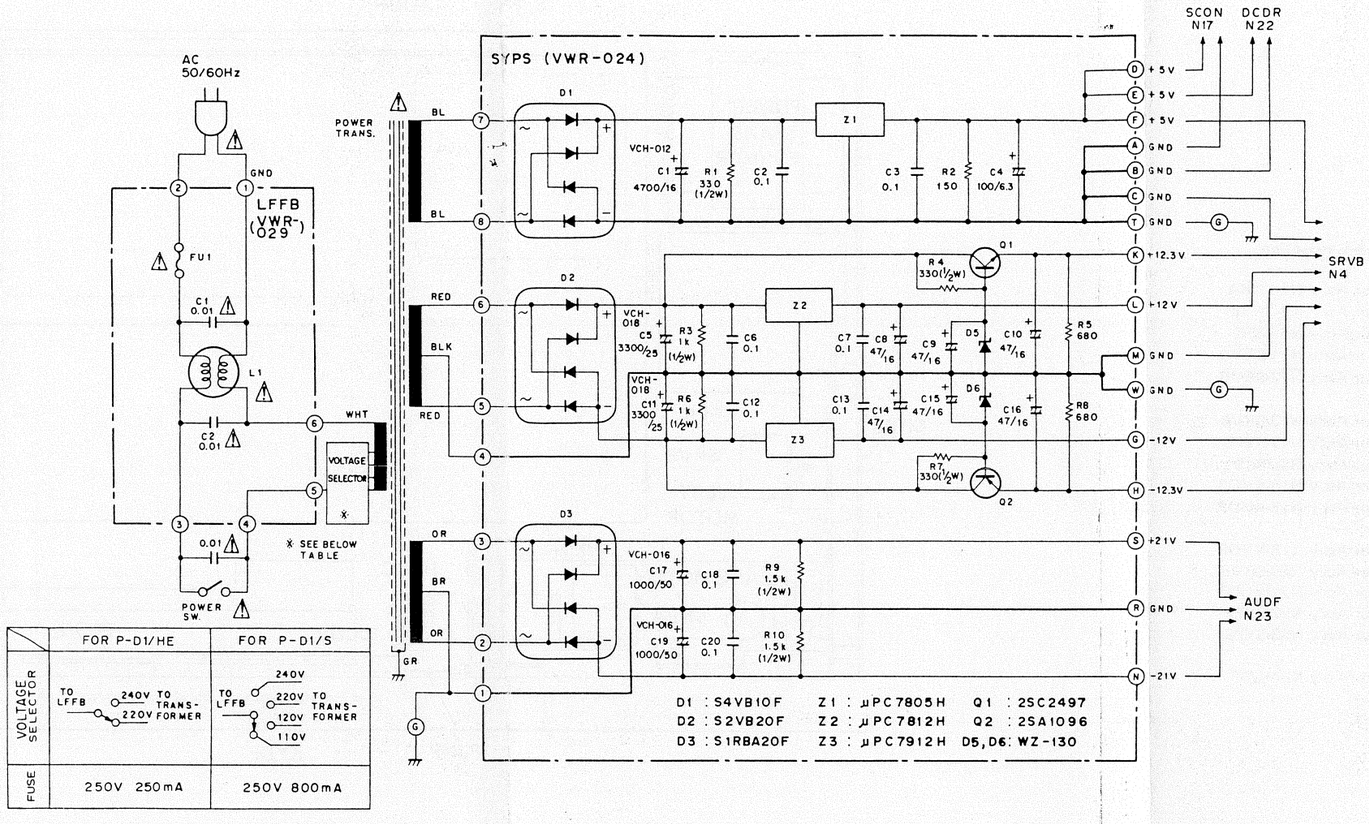
5-2 LOCATION OF PCBS



ABBREVIATION LIST

SYPS	System Power Supply
LFFB	Line-filter & Fuse Board
HALC	Head Amp. & Laser Control
SRVB	Servo Board
DCDR	Decoder Board
AUDF	Audio & Filter Board
SCON	System Control Board
CSUB	Control Sub Board
KYDP	Key & Display Board
CNBA	Connector Board A
CNBB	Connector Board B
PLMP	Pilot Lamp Board

5-3 SYPS (VWR-024), LFFB (VWR-029)



VOLTAGE SELECTOR	FOR P-D1/HE	FOR P-D1/S
	TO LFFB 240V 220V TO TRANSFORMER	TO LFFB 240V 220V 120V 110V TO TRANSFORMER
FUSE	250V 250mA	250V 800mA

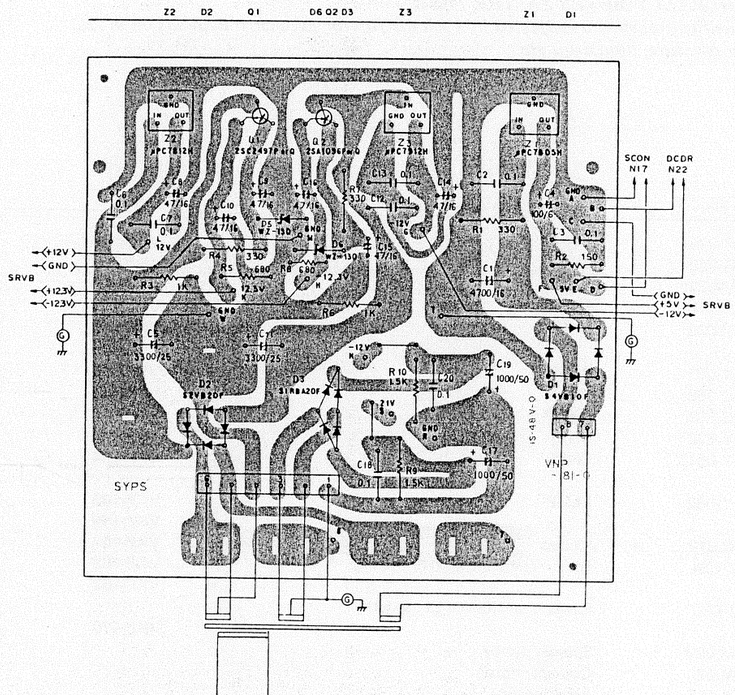
D1 : S4VB10F Z1 : μPC7805H Q1 : 2SC2497
D2 : S2VB20F Z2 : μPC7812H Q2 : 2SA1096
D3 : S1RBA20F Z3 : μPC7912H D5,D6: WZ-130

SYPS(VWR-024) Parts list 1

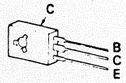
(MK)(Part No.)	(IT)(REF Nos. & DESCRIPTIONS)
UPC7805H	Z 1
UPC7812H	Z 2
UPC7912H	Z 3
2SC2497-P/Q	Q 1
2SA1096-P/Q	Q 2
S4VB10F	D 1
S2VB20F	D 2
S1RBA20F	D 3
WZ-130	D 5, 6
RS1/2PF□□□J	R 1, 3, 4, 6, 7, 9, 10
RD1/4PS□□□J	R 2, 5, 8
VCH-012	C 1 4700/16
CKDYF104Z50	C 2, 3, 6, 7, 12, 13, 18, 20
CEA101M6	C 4
VCH-018	C 5, 11 3300/25
CEA470M16	C 8- 10, 14- 16
VCH-016	C 17, 18

LFFB(VWR-029) Parts list 1

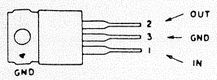
(MK)(Part No.)	(IT)(REF Nos. & DESCRIPTIONS)
VCG-018	C 1, 2
VTL-004	L 1



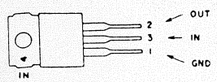
2SC2497
2SA1096

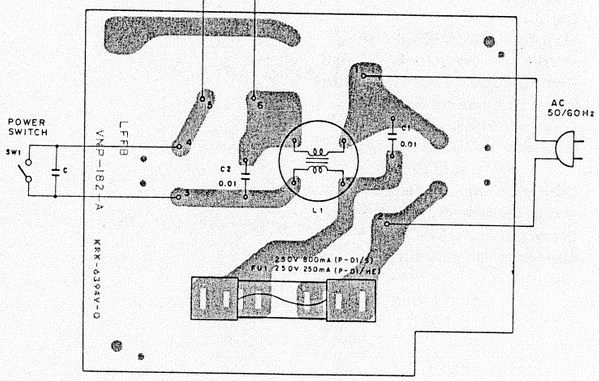


μPC7805H
μPC7812H

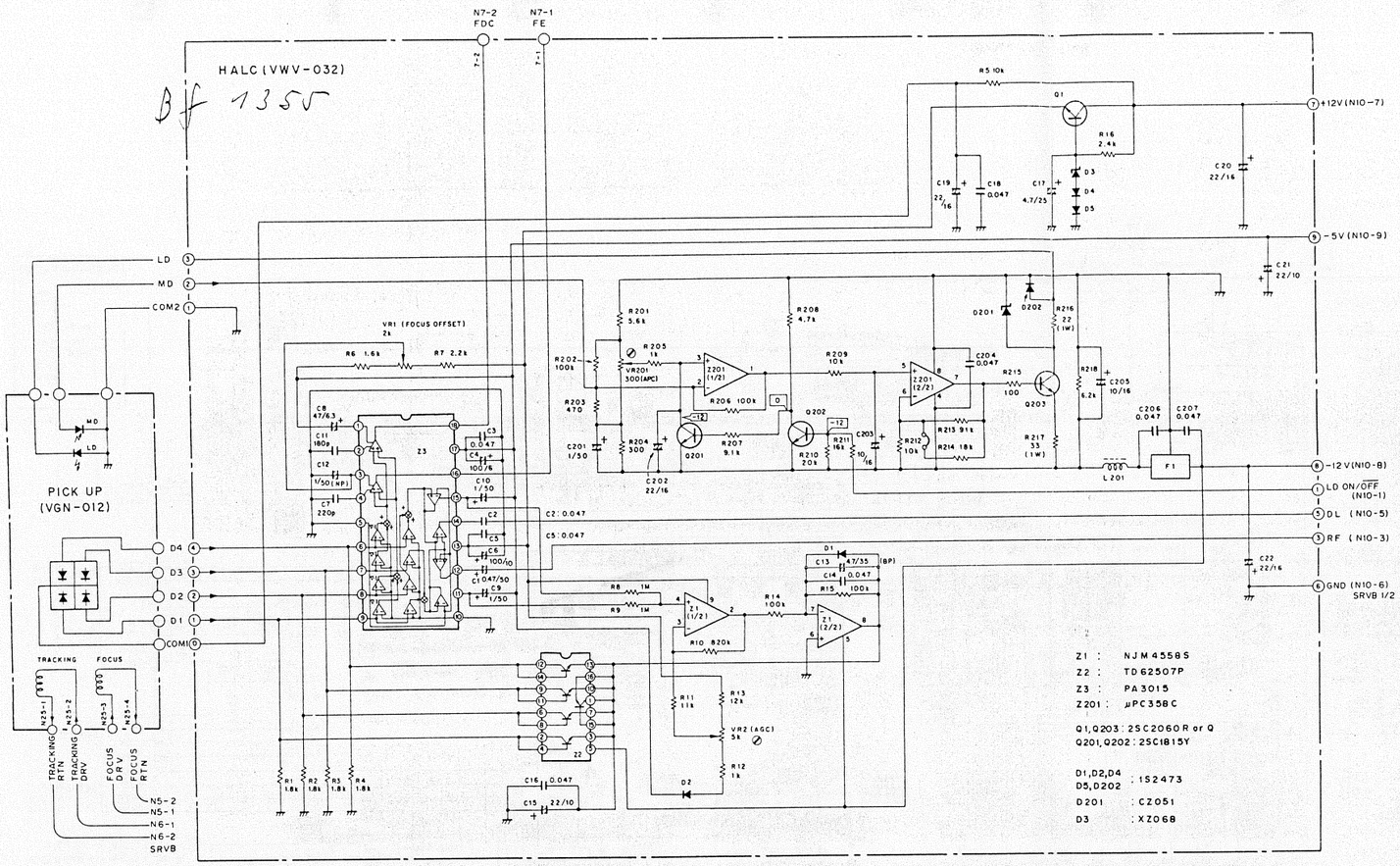


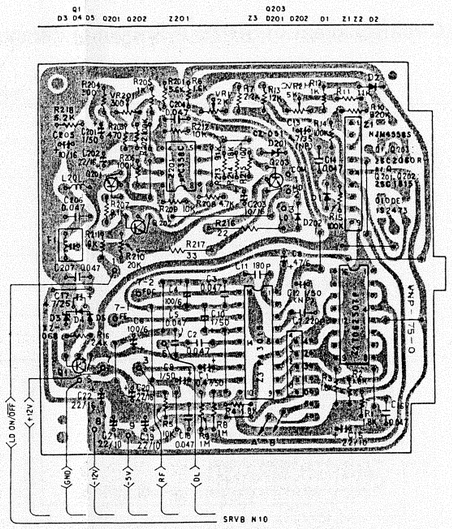
μPC7912H



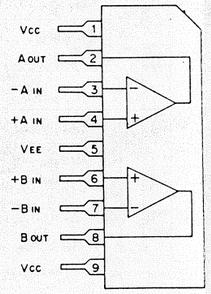


5-4 HALC (VWV-032)

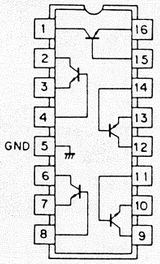




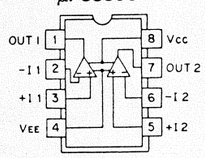
NJM4558S



TD62507P



μPC358C



2SC2060

2SA1015
2SC1815

HALC(VWV-032) Parts list 1

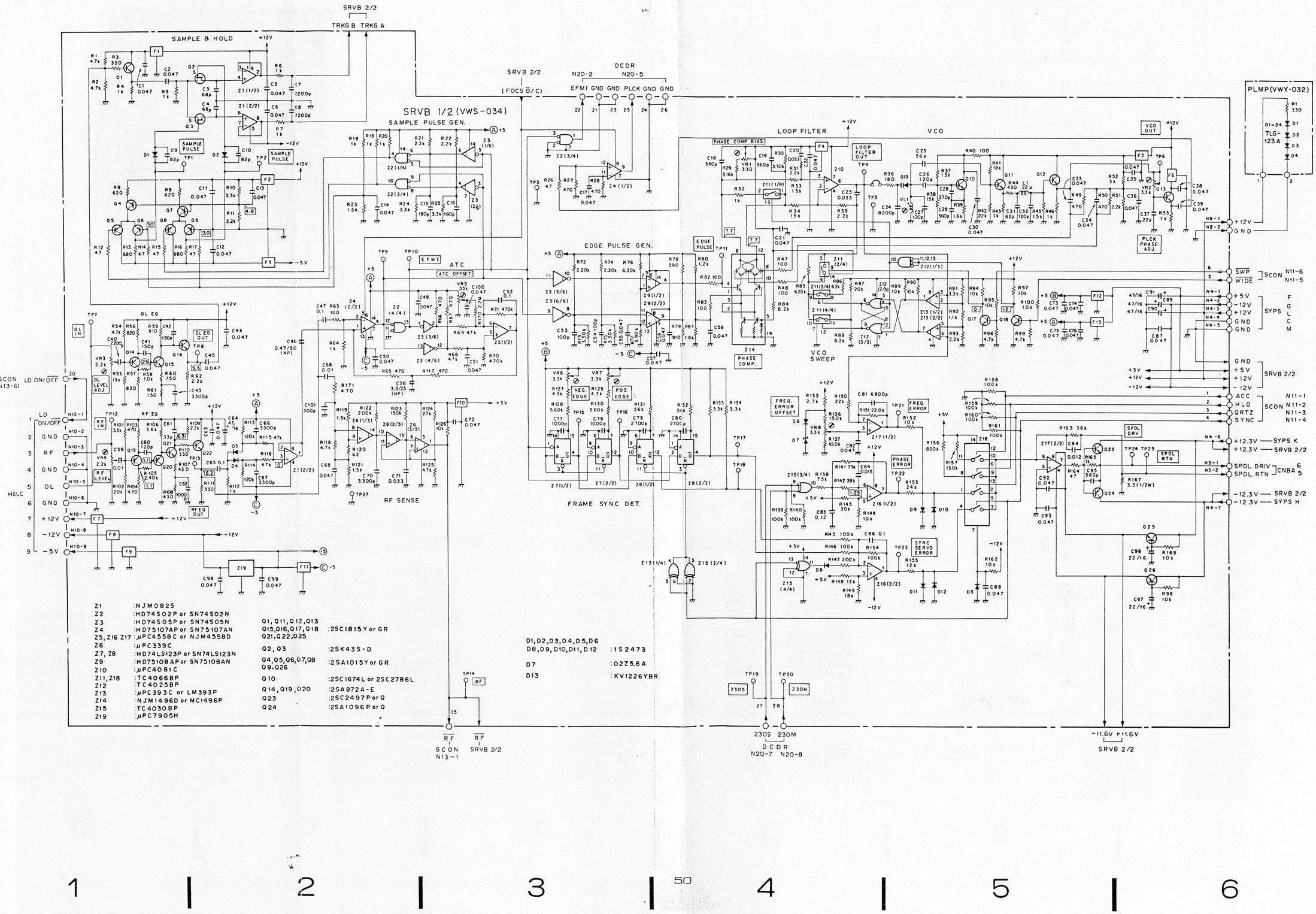
(MK)(Part No.)	(IT)(REF Nos. & DESCRIPTIONS)
NJM4558S	Z 1
TD62507P	Z 2
PA3015	Z 3
UPC358C	Z 201
2SC2060-R/Q	Q 1,203
2SC1815-Y	Q 201,202
1S2473	D 1, 2, 4, 5,202
XZ-068	D 3
CZ-051	D 201
RD1/4VS182J	R 1- 4
RD1/4VS103J	R 5,209,212
RD1/4VS162J	R 6
RD1/4VS222J	R 7
RD1/4VS105J	R 8, 9
RD1/4VS824J	R 10
RD1/4VS113J	R 11
RD1/4VS102J	R 12,205
RD1/4VS123J	R 13
RD1/4VS104J	R 14, 15,202,206

(MK)(Part No.)	(IT)(REF Nos. & DESCRIPTIONS)	
RD1/4VS242J	R 16	
RD1/4VS562J	R 201	
RD1/4VS471J	R 203	
RD1/4VS301J	R 204	
RD1/4VS912J	R 207	
RD1/4VS472J	R 208	
RD1/4VS203J	R 210	
RD1/4VS163J	R 211	
RD1/4VS913J	R 213	
RD1/4VS183J	R 214	
RD1/4VS101J	R 215	
VCN-083	R 216	220 ohm
VCN-084	R 217	33 ohm/1W
RD1/4VS622J	R 218	
VCR-041	VR 1	2 kohms
VCR-042	VR 2	5 kohm
VCR-040	VR201	300 ohm

(MK)(Part No.)	(IT)(REF Nos. & DESCRIPTIONS)	
CEAR47M50	C 1	
VCG-003	C 2, 3, 5, 14, 16, 18,204, 206,207	
CEA101M6	C 4	
CEA101M10	C 6	
CCDSL221J50	C 7	
CEA470M6	C 8	
CEA010M50	C 9, 10,201	
CCDSL181J50	C 11	
CEA010M50NP	C 12	
CEA4R7M35NP	C 13	
CEA220M10	C 15, 21	
CEA4R7M25	C 17	
CEA220M16	C 19, 20, 22,202	
CEA100M16	C 203,205	
VTH-007	L 201	Choke coil
VTH-005	VL 1	

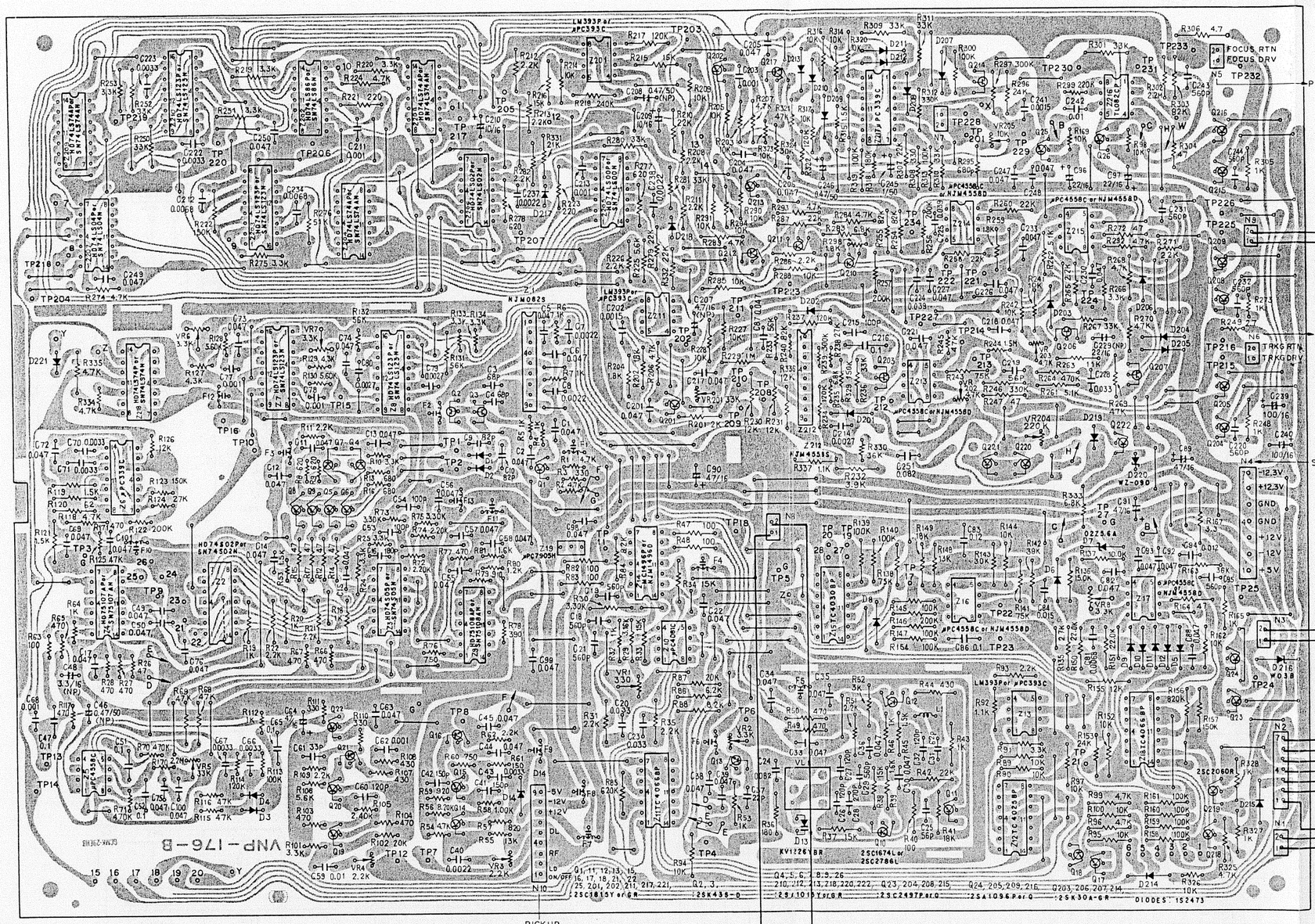
5-5 SRVB (VWS-034) 1/2, PLMP (VWY-032)

Note: Other Half Circuitdiagram of SRVB is Shown in Paragraph 5-6.



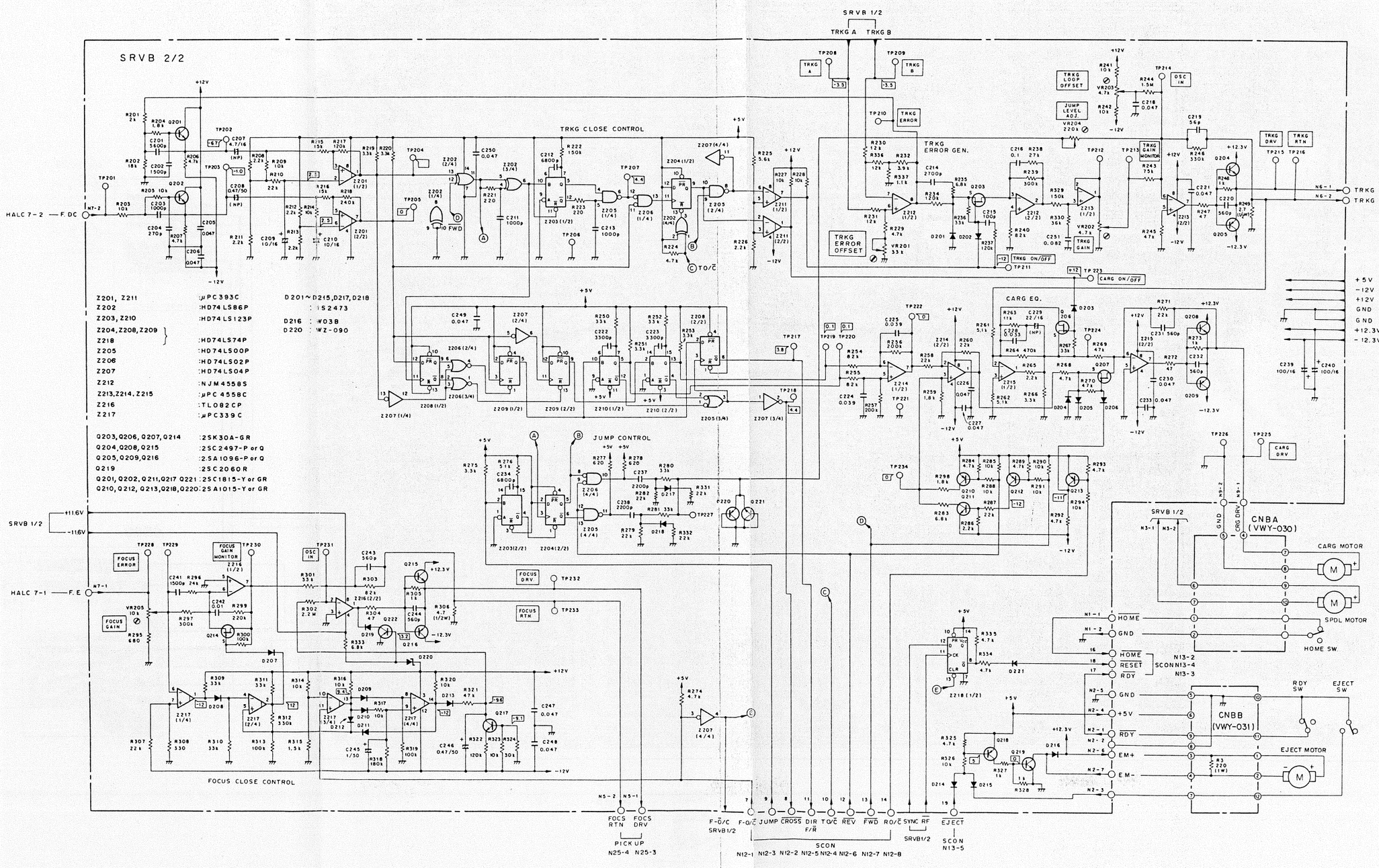
Z1	:NJM082S	Q1, Q11, Q12, Q13	
Z2	:HD74S02P or SN74S02N	Q15, Q16, Q17, Q18	:2SC1815Y or GR
Z3	:HD74S05P or SN74S05N	Q21, Q22, Q25	
Z4	:HD75107AP or SN75107AN	Q2, Q3	:2SK43S-D
Z5, Z16 Z17	:μPC4558C or NJM4558D	Q4, Q5, Q6, Q7, Q8 Q9, Q26	:2SA1015Y or GR
Z6	:μPC339C	Q10	:2SC1674L or 2SC2786L
Z7, Z8	:HD74LS123P or SN74LS123N	Q14, Q19, Q20	:2SA872A-E
Z9	:HD75108AP or SN75108AN	Q23	:2SC2497P or Q
Z10	:μPC4081C	Q24	:2SA1096P or Q
Z11, Z18	:TC4066BP	D1, D2, D3, D4, D5, D6	
Z12	:TC4025BP	D8, D9, D10, D11, D12	:1S2473
Z13	:μPC393C or LM393P	D7	:02Z5.6A
Z14	:NJM1496D or MC1496P	D13	:KV1226YBR
Z15	:TC4030BP		
Z19	:μPC7905H		

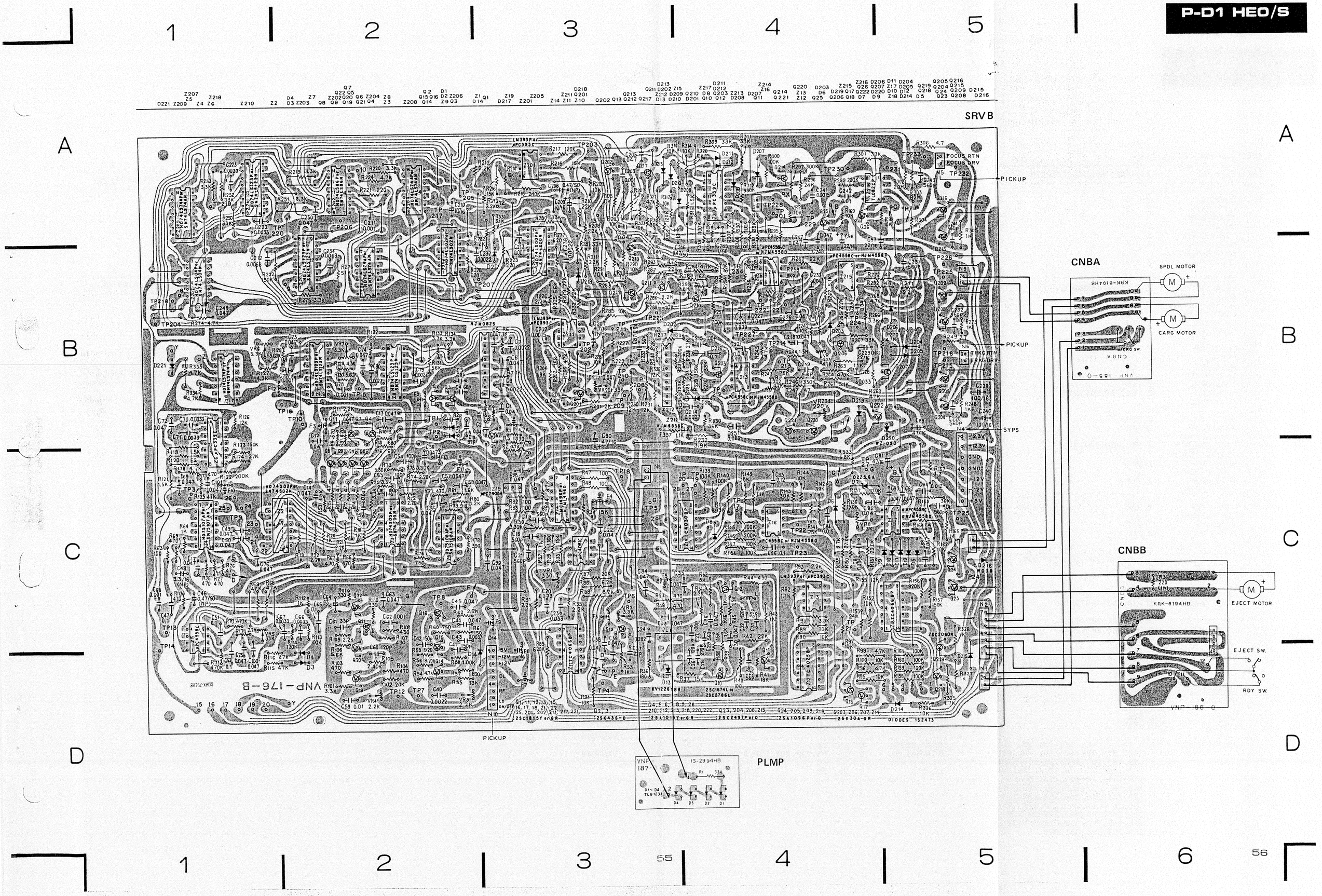
SRVB


VNP-176-B
PICKUP
PICKUP
SYPS
TRKG RTN
TRKG DRV
FOCUS RTN
FOCUS DRV
PICKUP
CNBA
SPDL MOTOR
CARG MOTOR
CNBB
EJECT MOTOR
EJECT SW.
RDY SW.
PLMP

5-6 SRVB (VWS-034) 2/2, CNBA (VWY-030), CNBB (VWY-031)

Note: Other Half Circuitdiagram of SRVB is Shown in Paragraph 5-5.




SRVB
CNBA
SPDL MOTOR
CARG MOTOR
CNBB
EJECT MOTOR
EJECT SW.
RDY SW.
PICKUP
SYPS
PLMP
VNP-176-B
VNP-186-0
KRK-6194HB
IS-2994HB
FOCUS RTN
FOCUS DRV
55
56

SRVB(VWS-034) Parts list 1

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)
NJM082S	Z	1
HD74S02P (SN74S02N)	Z	2
HD74S05P (SN74S05N)	Z	3
HD75107AP (SN75107AN)	Z	4
UPC4558C	Z	5
UPC339C	Z	6,217
HD74LS123P (SN74LS123N)	Z	7, 8,203,210
HD75108AP (SN75108AN)	Z	9
UPC4081C	Z	10
TC4066BP	Z	11, 18
TC4025BP	Z	12
LM393P	Z	13,201,211
MC1496P (NJM1496D)	Z	14
TC4030BP	Z	15
UPC4558C (NJM4558D)	Z	16, 17,213-215
UPC7905H	Z	19
HD74LS86P (SN74LS86N)	Z	202
HD74LS74AP (SN74LS74AN)	Z	204,208,209,218
HD74LS00P (SN74LS00N)	Z	205
HD74LS02P (SN74LS02N)	Z	206
HD74LS04P (SN74LS04N)	Z	207
NJM4558S	Z	212
TL082CP	Z	216
2SC1815-Y/GR	Q	1, 11- 13, 15- 18, 21, 22, 25,201,202,211,217,221
2SK43S-D	Q	2, 3
2SC1674-L (2SC2786-L)	Q	10
2SA872A-E	Q	14, 19, 20
2SC2497-P/Q	Q	23,204,208,215
2SA1096-P/Q	Q	24,205,209,216
2SK30A-GR	Q	203,206,207,214
2SC2060R	Q	219
1SS133T-77	D	1, 3, 4
1S2473	D	2, 5, 8- 12,201-215,217-219,221
02Z5.6A	D	7
KV1226YBR	D	13
BZ140	D	14
W03B	D	216
WZ-090	D	220
RD1/4PS□□□J	R	1- 7, 10, 11, 23, 25, 28, 54, 55, 59, 62- 69, 79, 80, 98,101,102,106,109,110,112-117,122,124-126,131-134,138-143,145-147,153,154,156-161,163,169,217,218,222,234-237,240,243,245,246,250,252,254-256,264,267,269,270,276,279-282,287,296,297,299-303,307,309,310,312,313,318,319,321,323,324,326,331,332

SRVB(VWS-034) Parts list 2

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)	
RD1/4VS□□□J	R	8, 9, 13, 16, 26, 27, 78, 81,111,123,170,238,239,244,271,273,274,298,330,334,232,257,263,283,291,295,308,315,322,325,329,333,335,337	
RD1/4PS□□□J	R	12, 14, 15, 17- 22, 24, 31-35, 37, 38, 40- 43, 45- 51, 53, 82- 84, 88- 91, 93- 97, 99,100,118,119,121,144,149,152,155,164,165,171,202-209,211-215,219,220,224,226-228,230,231,241,242,247,248,251,253,258-262,265,266,268,272,275,277,278,284-286,288-290,292-294,304,305,314,316,317,320,327,328,336	
RN1/4PR□□□□F	R	29, 30, 56- 58, 60, 61, 72-77,103-105,107,108,128,130,136,137,150,151	
RD1/4PS□□□J	R	36, 39, 44, 52, 85- 87, 92, 120,135,148,162,171,201,210,216,221,223,225,229,232,257,263,283,291,295,308,315,322,325,329,333,335,337	
RD1/4PS□□□J	R	70, 71, 3- 7, 10, 11, 23, 25, 28, 54, 55, 59, 62- 69, 79, 80, 98,101,102,106,109,110,112-117,122,124-126,131-134,138-143,145-147,153,154,156-161,163,169,217,218,222,234-237,240,243,245,246,250,252,254-256,264,267,269,270,276,279-282,287,296,297,299-303,307,309,310,312,313,318,319,321,323,324,326,331,332	
VCN-085	R	127,129	4300 ohm
RD1/2PF□R□J	R	167,249,306	
VCR-035	VR	1	330 ohm
VCP-046	VR	2	3.3 kohm
VCP-045	VR	3, 4	2.2 kohm
VCP-050	VR	5,201	33 kohm
VCP-036	VR	6- 8	3.3 kohm
VCP-047	VR	202,203	4.7 kohm
VCP-053	VR	204	220 kohm
VCP-048	VR	205	10 kohm
VCG-023	C	1, 2, 6, 11- 13, 17, 21, 22, 33- 35, 38, 39, 44, 45, 55- 58, 63, 69, 73- 75, 82, 87, 92, 93, 98-100,205,221,227,230,233,248,250	
CQSH680J50	C	3, 4	
VCG-003	C	5, 14, 30, 36, 49, 50, 72, 76, 88,206,218,226,249	
VCG-022	C	7, 8, 40	
CCDSL820J50	C	9, 10	
CCDSL181J50	C	15, 16	
CCDSL561J50	C	19, 95,220,231,232,243,244	
VCE-015	C	20, 23	0.0033 u

SRVB(VWS-034) Parts list 3

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)	
CQMA822J50	C	24	
CCDSL560J50	C	25,219	
CCDRH121J50	C	26, 27	
CCDRH271J50	C	28	
CQSH561J50	C	29	
CCDSL620J50	C	31	
CCDSL121J50	C	32	
CCDSL220J50	C	37	
VCE-012	C	41	150 p
CCDSL151J50	C	42	
VCE-014	C	43	3300 p
CEAR47M50NP	C	46,208	
CQMA104J50	C	47, 51, 52, 65, 86,216	
CEA3R3M16NP	C	48	
VCE-010	C	53, 54	100 p
CKDYF103Z50	C	59	
VCE-011	C	60	
CCDSL561J50	C	61	
VCE-013	C	62	1000 p
CEA470M16	C	64, 89- 91	
CQMA332J50	C	66, 67,222,223	
VCG-019	C	68	
CQMA332J50	C	70	
CQMA333J50	C	71	
CQSH102J50	C	77, 78	
CQMA272J50	C	79, 80	
CQMA682J50	C	81,212,234	
CQMA124J50	C	83	
CQMA153J50	C	84	
CQMA123J50	C	94	
CEA220M16	C	96, 97	
CCDSL331J50	C	101	
CQMA562J50	C	201	
CQMA152J50	C	202,241	
CQMA102J50	C	203	
CCDSL271J50	C	204	
CEA4R7M16NP	C	207	
CEA100M16	C	209,210	
VCG-024	C	211,213	
CQMA272J50	C	214	
CCDSL101J50	C	215	
CQMA393J50	C	224,225	
CQMA333J50	C	228	
CEA220M16NP	C	229	
CQMA222J50	C	237,238	
CEA101M16	C	239,240	
CQMA103J50	C	242	
CEA010M50	C	245	
CEAR47M50	C	246	
CQMA823J50	C	251	
VTL-096	L	1	
VTH-005	F	1- 13	

PLMP(VWY-032) Parts list 1

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)	
TLG123A	D	1- 4	
RD1/4PS331J	R	1	

CNBA(VWY-030) Parts list 1

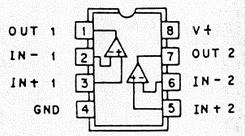
(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)
VSF-008	SW	1

CNBB(VWY-031) Parts list 1

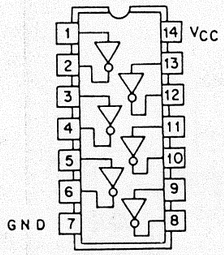
(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)	
VCN-087	R	3	220 ohm/1W

SRVB

μPC393C
LM393P



SN74LS04N
HD74LS04P



μPC4558C
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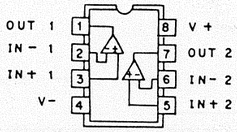
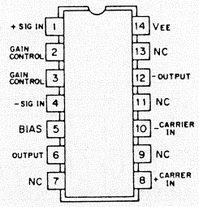
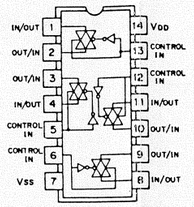


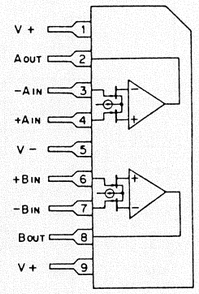
NJM1496D



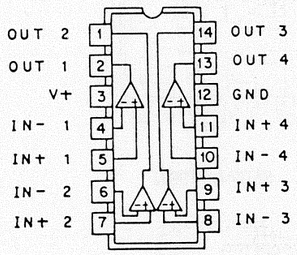
TC4066BP



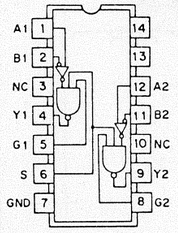
NJM082S



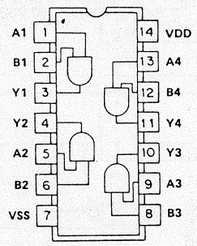
μPC339C



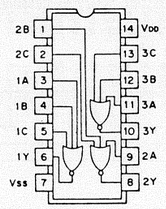
HD75108AP



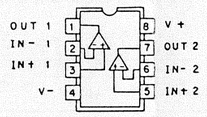
μPC4081C



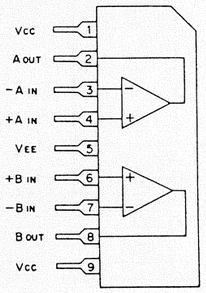
TC4025BP



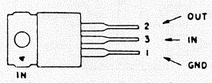
TL082CP



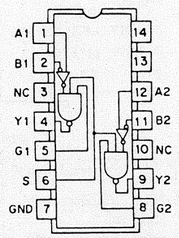
NJM4558S



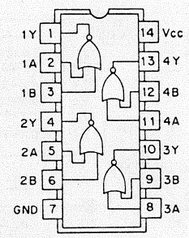
μPC7905H



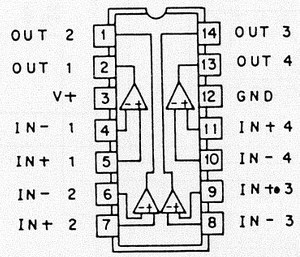
HD75107AP



HD74S02P



μPC339C

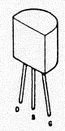


2SK30A

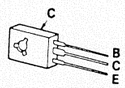
2SC2060

2SA1015
2SC1815

2SK43

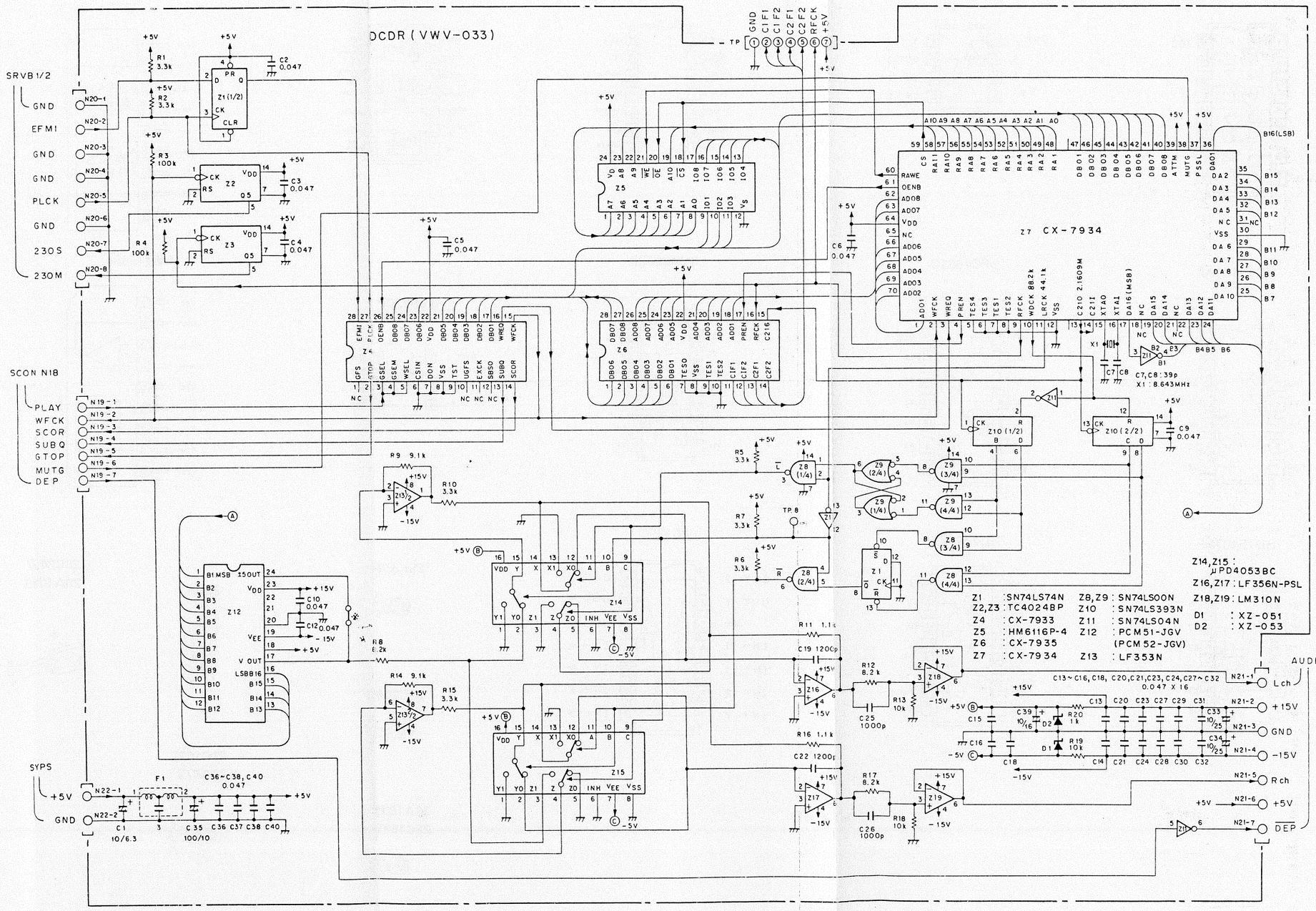


2SC2497
2SA1096



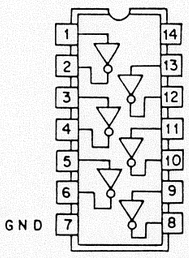
2SC1672
2SA872

5-7 DCDR (VWV-033)

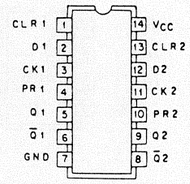


* In case of PCM51JG-V, short circuit.
In case of PCM52JG-V, open circuit.

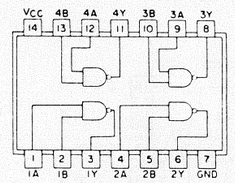
SN74LS04N
HD74LS04P



SN74LS74AN



HD74LS00P
SN74LS00N



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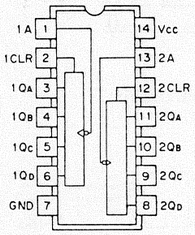
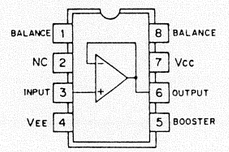
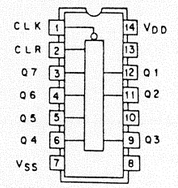


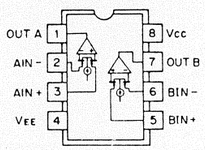
LM310N

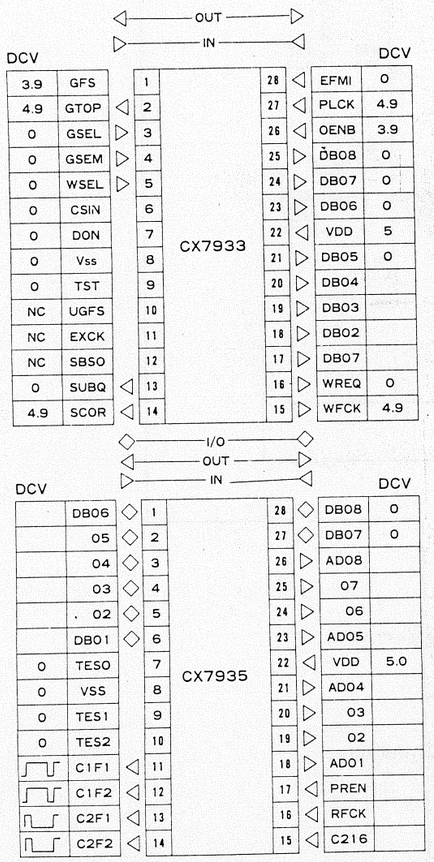


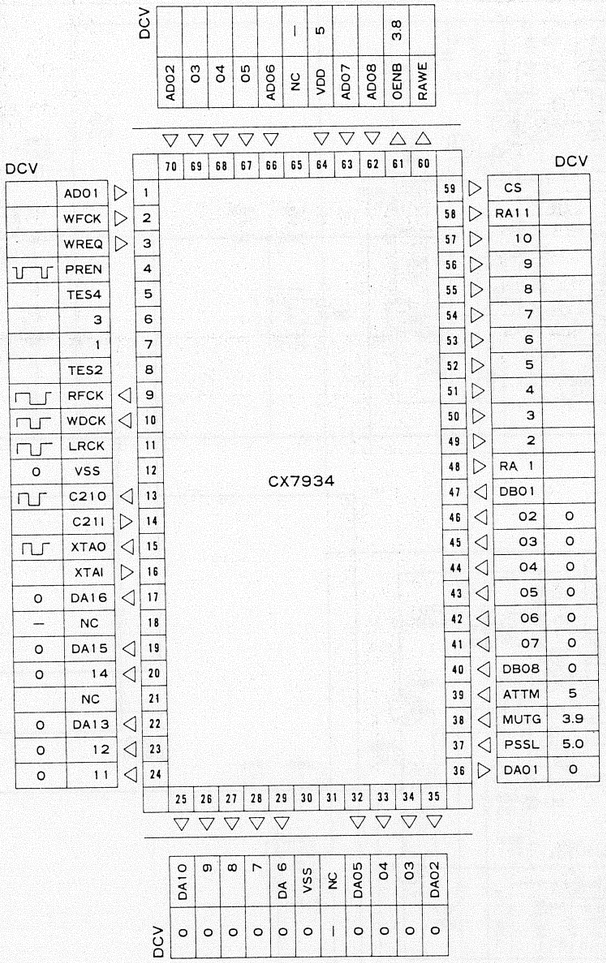
TC4024BP
MB84024BM



LF353N

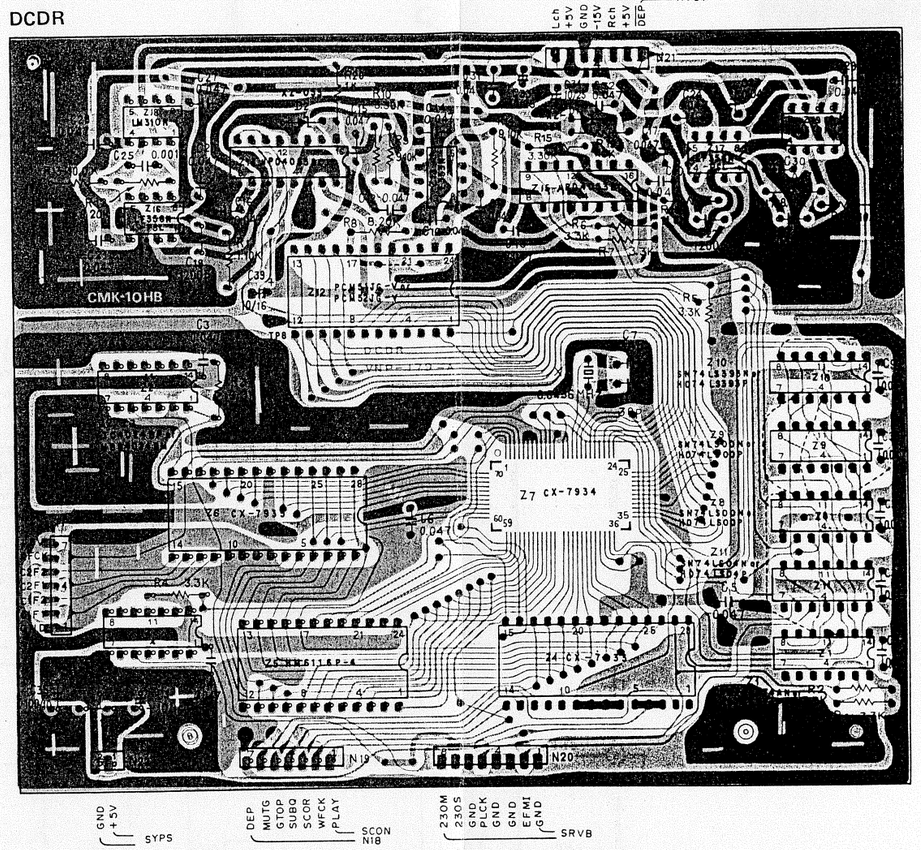






※電圧値はスタンバイ時の直流電圧を示す.

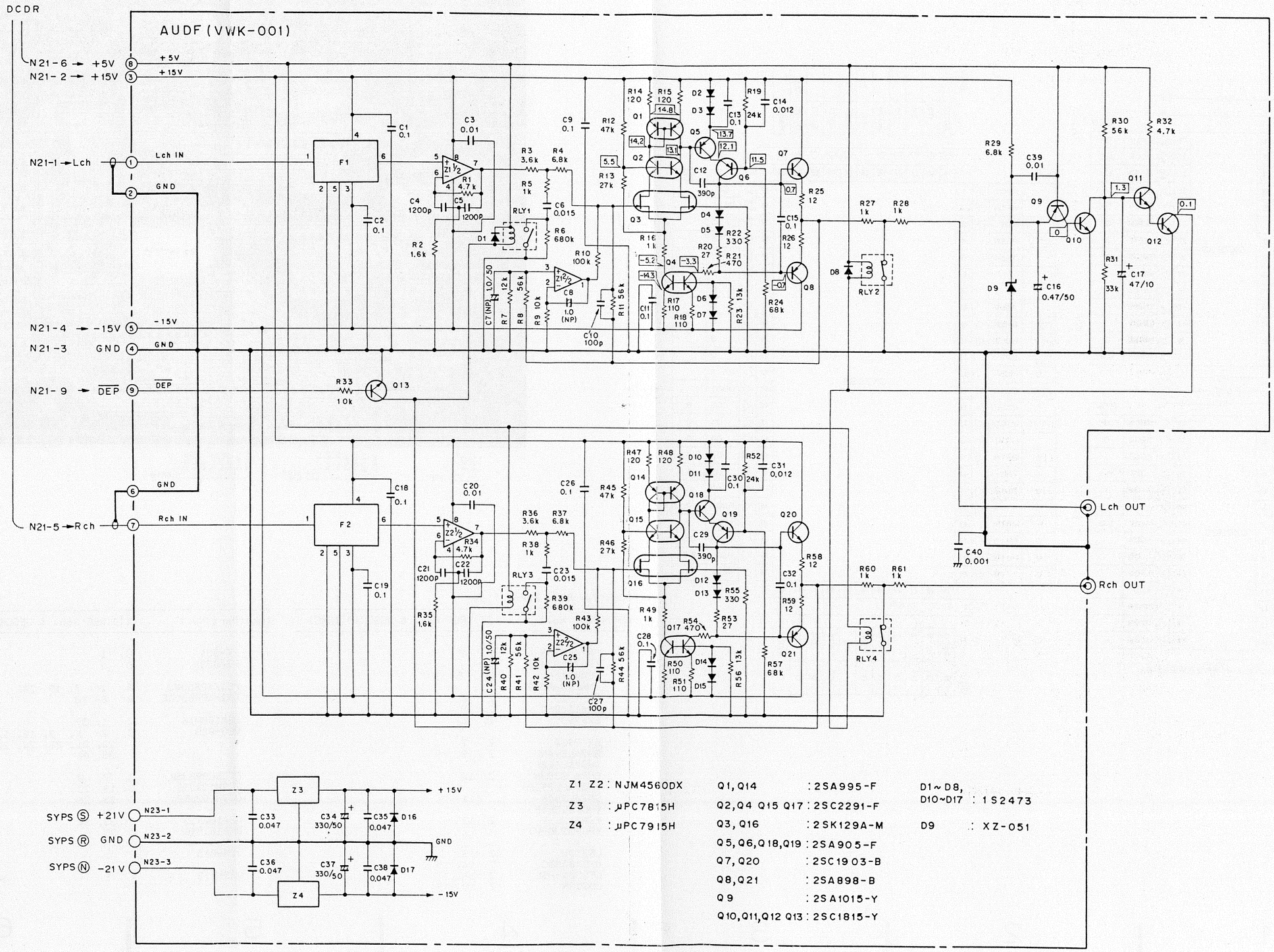
DCDR



DCDR(VWV-033) Parts list 1

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)
SN74LS74N (HD74LS74P)	Z	1
TC4024BP (MB84024BM)	Z	2, 3
CX-7933	Z	4
HM6116P-4	Z	5
CX-7935	Z	6
CX-7934	Z	7
SN74LS74N (HD74LS00P)	Z	8, 9
SN74LS393N (HD74LS393P)	Z	10
SN74LS04N (HD74LS04P)	Z	11
PCM51JG-V (PCM52JG-V)	Z	12
LF353N	Z	13
UPD4053BC	Z	14, 15
LF356N-PSL	Z	16, 17
LM310N	Z	18, 19

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)
XZ-051	D	1
XZ-053	D	2
PD1/4PS□□□J	R	1- 7, 19, 20
RN1/4PR□□□□F	R	8- 18
CEA100M16	C	1, 39
VCG-003	C	2- 6, 9, 10, 12- 16, 18, 20, 21, 23, 24, 27- 32, 36- 38, 40
CCDSL390J50	C	7, 8
CQSH122J50	C	19, 22
CQSH102J50	C	25, 26
CEA100M25	C	33, 34
CEA101M10	C	35
VTH-005	F	1
VSS-013	X	1 8.6436 MHz



Z1 Z2 : NJM4560DX

Z3 : μPC7815H

Z4 : μPC7915H

Q1, Q14 : 2SA995-F

Q2, Q4 Q15 Q17 : 2SC2291-F

Q3, Q16 : 2SK129A-M

Q5, Q6, Q18, Q19 : 2SA905-F

Q7, Q20 : 2SC1903-B

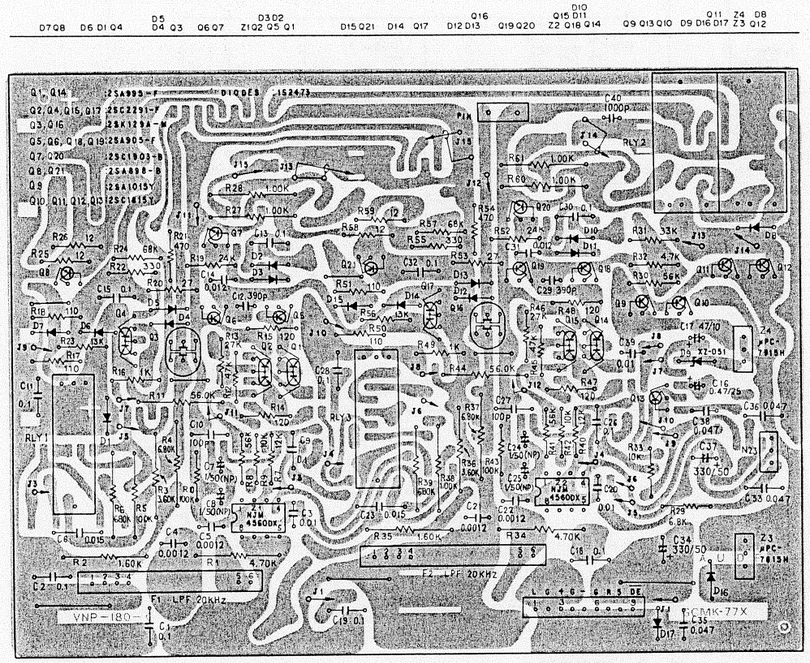
Q8, Q21 : 2SA898-B

Q9 : 2SA1015-Y

Q10, Q11, Q12 Q13 : 2SC1815-Y

D1 ~ D8, D10 ~ D17 : 1S2473

D9 : XZ-051

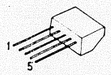


AUDF(VWK-001) Parts list 1

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)	
NJM4560DX	Z	1, 2	
UPC7815H	Z	3	
UPC7915H	Z	4	
2SA995-F	Q	1, 14	
2SC2291-F	Q	2, 4, 15, 17	
2SK129A-M	Q	3, 16	
2SA905-F	Q	5, 6, 18, 19	
2SC1903-B	Q	7, 20	
2SA898-B	Q	8, 21	
2SA1015-Y	Q	9	
2SC1815-Y	Q	10- 13	
1S2473	D	1- 8, 10- 17	
XZ-051	D	9	
VCN-079	R	1, 34	4700 ohm
VCN-077	R	2, 35	1600 ohm
VCN-078	R	3, 36	3600 ohm
VCN-080	R	4, 37	6800 ohm
VCN-076	R	5, 27, 28, 38, 60, 61	1000 ohm
VCN-082	R	6, 39	680 kohm
RD1/4PS000J	R	7- 10, 12- 21, 23- 26, 29- 33, 40- 43, 45- 54, 56, 57, 59	
VCN-081	R	11, 44	
RN1/4PR0000F	R	22, 55	
CQMA104J50	C	1, 2, 9, 11, 13, 15, 18, 19, 26, 28, 30, 32	
CQMA103J50	C	3, 20	
VCE-016	C	4, 5, 21, 22	
VCE-008	C	6, 23	
CEA010M50NP	C	7, 8, 24, 25	
VCF-001	C	10, 27	
CQSH391J50	C	12, 29	
CQMA123J50	C	14, 31	
CEAR47M50	C	16	
CEA470M10	C	17	
VCG-003	C	33, 36	
VCH-017	C	34, 37	
VCG-025	C	35, 38	
CKDYF103Z50	C	39	
CKDYB102K50	C	40	
VTF-046	F	1, 2	LPF 20kHz
VSR-002	RL	1, 3	
VSR-003	RL	2, 4	

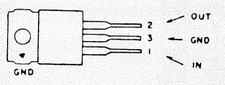
2SA1015
2SC1815

2SC2291
2SA995

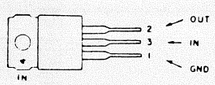


2SA905

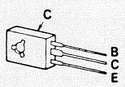
μPC7815H



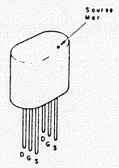
μPC7915H



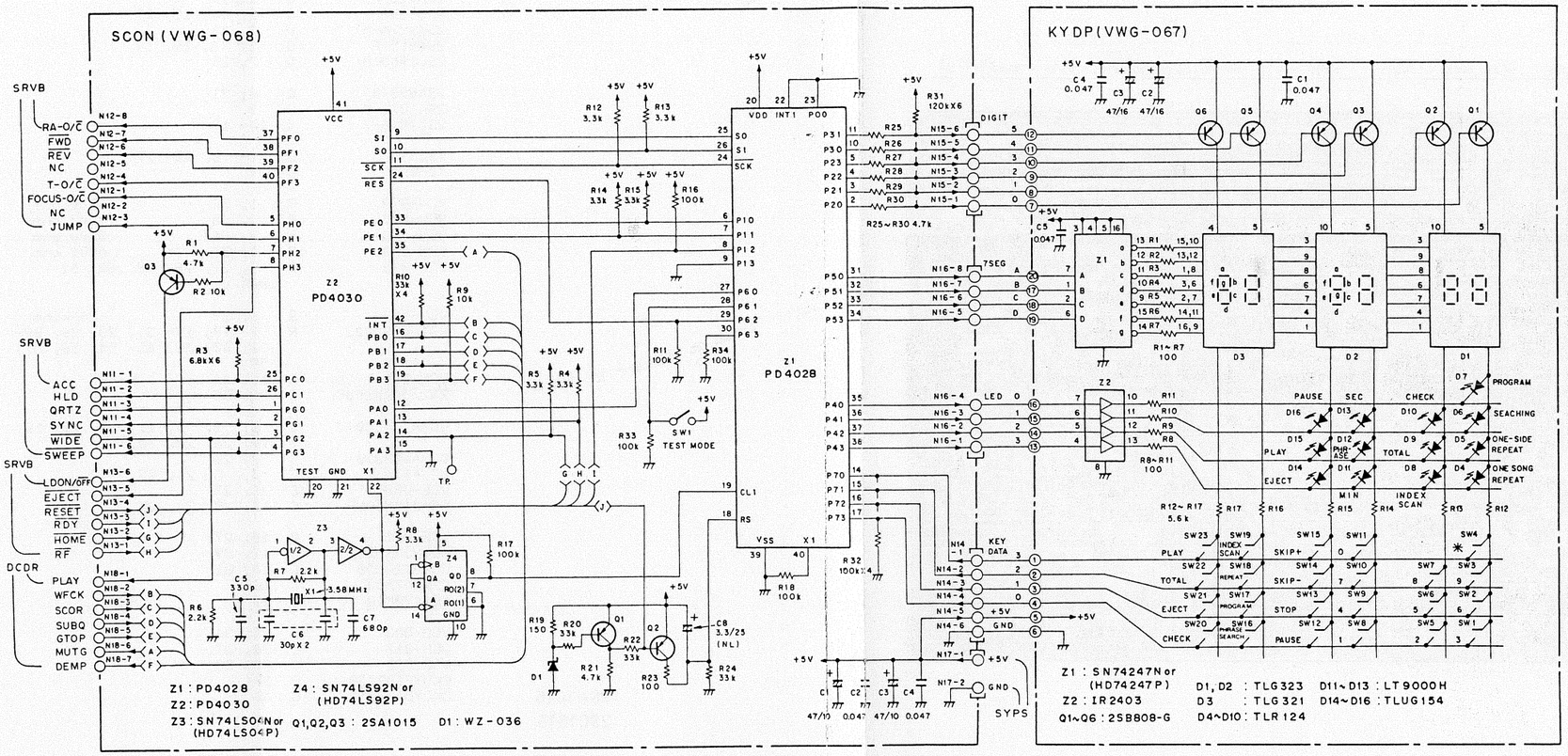
2SA898
2SC1903



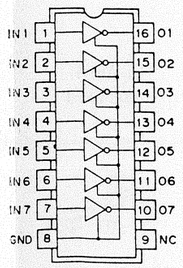
2SK129A



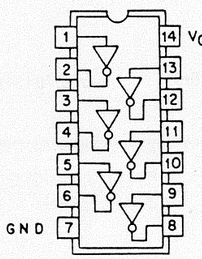
5-9 SCON (VWG-068), KYDP (VWG-067)



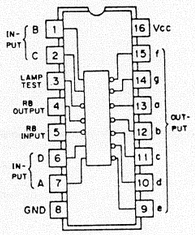
IR2403



SN74LS04N
HD74LS04P

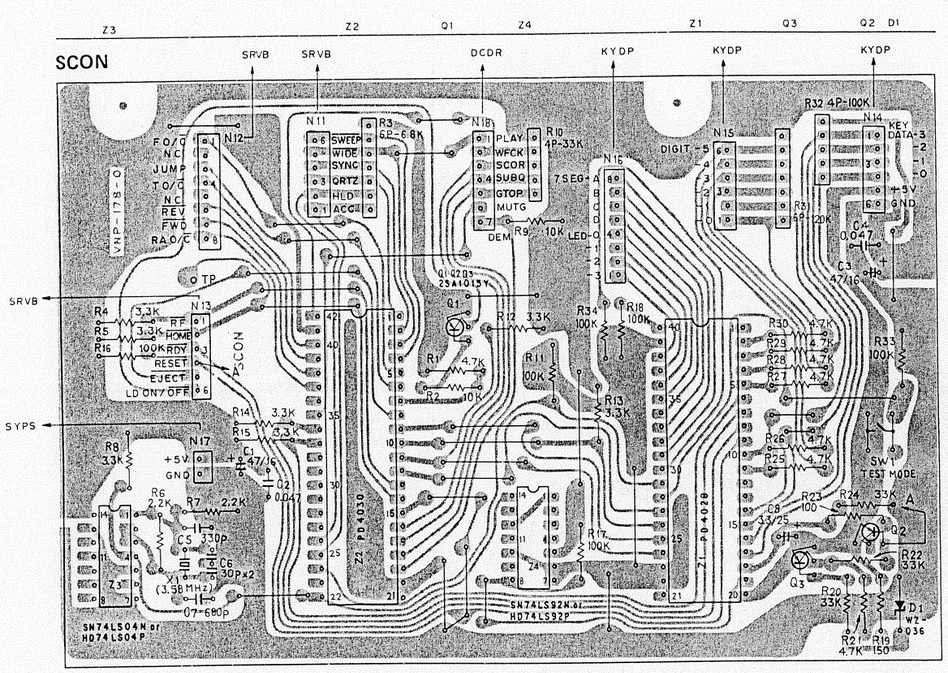


SN74247N



2SA1015
2SC1815

2SB808



SCON(VWG-068) Parts list 1

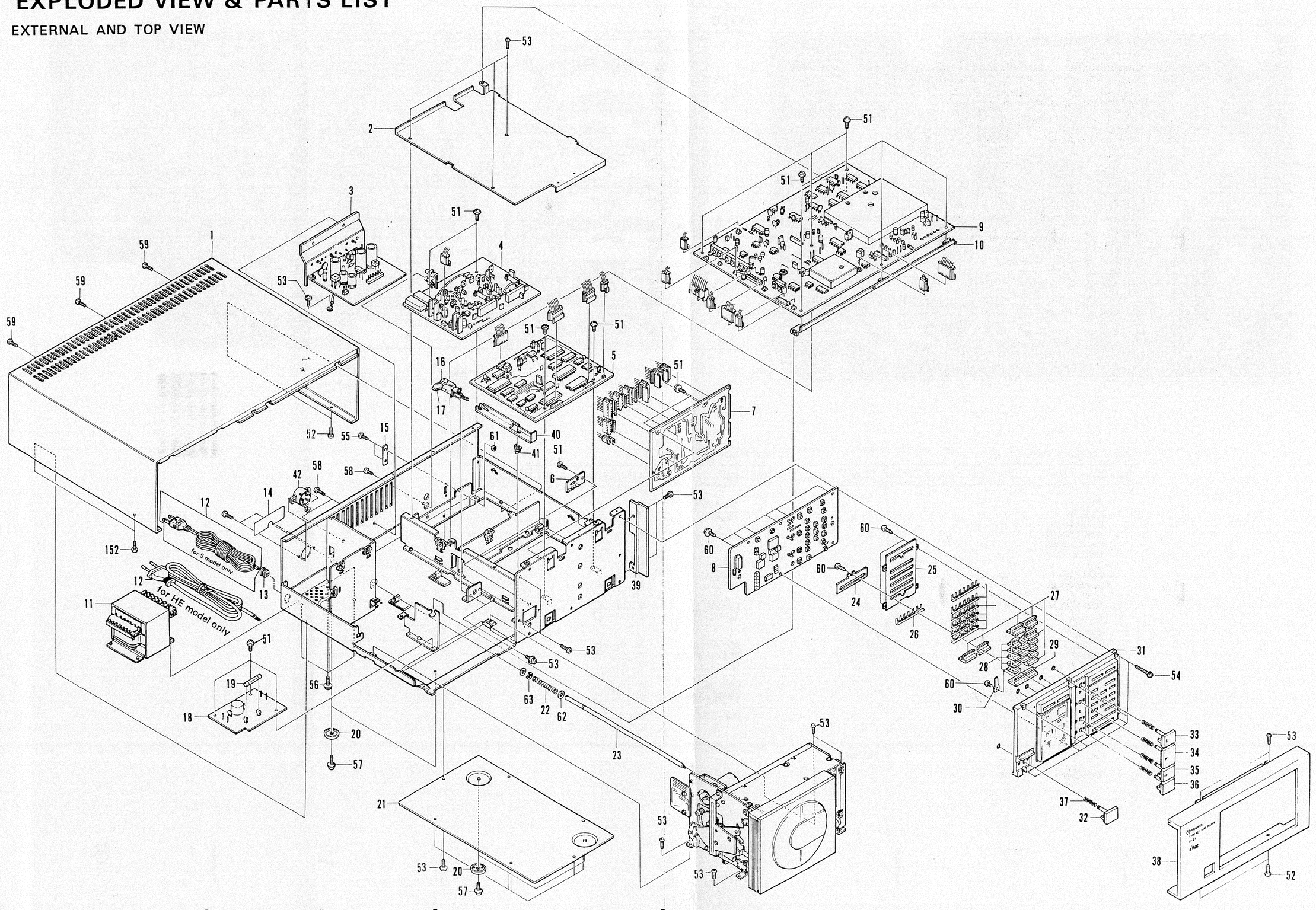
(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)
PD4028	Z 1	
PD4030	Z 2	
SN74LS04N (HD74LS04P)	Z 3	
SN74LS92N (HD74LS92P)	Z 4	
2SA1015-Y	Q 1- 3	
WZ-036	Q 1	
RD1/4PS□□□J	R 1, 2, 4- 9, 11- 30, 33, 34	
VCN-074	R 3	6.8k 6P
VCN-072	R 10	33K 4P
VCN-075	R 31	120k 6P
VCN-073	R 32	100k 4P
CEA470M16	C 1, 3	
VCG-003	C 2, 4	
CCDSL331J50	C 5	
CCDSL681K50	C 7	
CEANL3R3M25	C 8	
VSS-014	X 1	3.58 MHz
VSC-006	SW 1	

KYDP(VWG-067) Parts list 1

(MK)(Part No.)	(IT)	(REF Nos. & DESCRIPTIONS)
SN74247N	Z 1	
IR2403	Z 2	
2SB808-B	Q 1- 6	
TLG323	D 1, 2	
TLG321	D 3	
TLR123	D 4- 10	
LT-9000H	D 11- 13	
TLUG154	D 14- 16	
RD1/4PS101J	R 1- 11	
RD1/4PS562J	R 12- 17	
VCG-003	C 1, 4, 5	
CEA470M16	C 2, 3	
VSC-006	SW 1- 23	

6. EXPLODED VIEW & PARTS LIST

6-1 EXTERNAL AND TOP VIEW

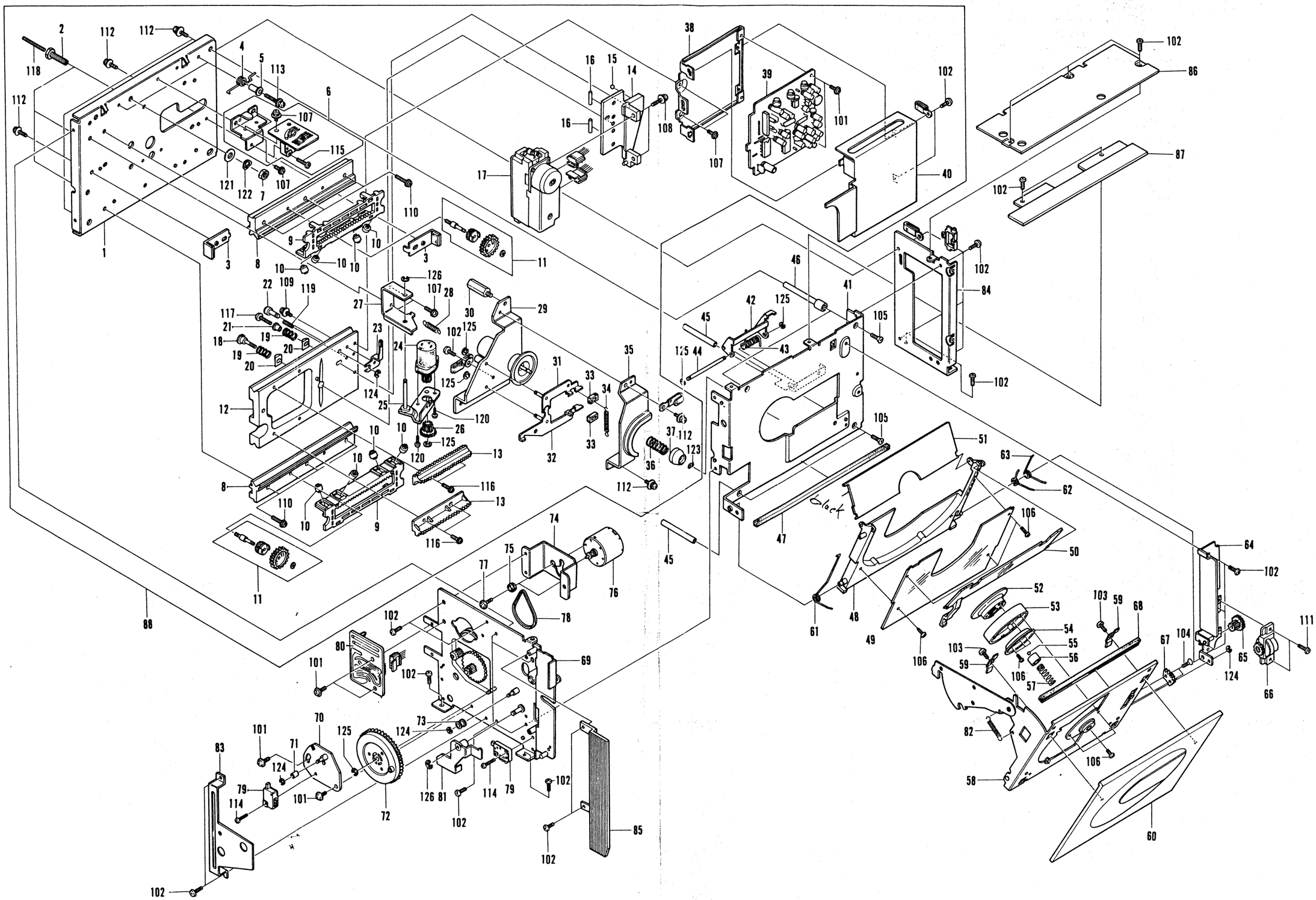


NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Parts List

Mark	No.	Part No.	Description
	1.	VXA-109	Bonnet
	2.		Shielding plate
	3.	VWR-024	SYPS
	4.	VWK-001	AUDF
	5.	VWV-033	DCDR
	6.	VWY-032	PLMP
	7.	VWG-068	SCON
	8.	VWG-067	KYDP
	9.	VWS-034	SRVB
	10.		Angle
⚠	11.	VTT-024	Power Transformer (HE model)
⚠	11.	VTT-030	Power Transformer (S model)
⚠	12.	VDG-011	Power cord (HE model)
⚠	12.	VDG-013	Power cord (S model)
	13.	VEC-111	Cord stopper
	14.	VRW-142	Caution label
	15.		Plate
⚠	16.	VSA-006	Power switch
⚠	17.	VCG-018	Capacitor
⚠	18.	VWR-029	LFFB
⚠	19.	VEK-012	Fuse 250V/250mA (HE model)
⚠	19.	VEK-013	Fuse 250V/800mA (S model)
	20.	VNL-122	Foot
	21.	VNE-402	Bottom plate
	22.		Spring
	23.		Shipping screw
	24.	VNE-322	Plate B
	25.	VNE-321	Plate A
	26.	VBK-010	Leaf
	27.	VAC-124	Button A
	28.	VAC-126	Button C
	29.	VAC-125	Button B
	30.	VBK-011	Leaf
	31.	VXX-082	Button holder
	32.	VXA-098	POWER button
	33.	VXA-094	EJECT button
	34.	VXA-095	PLAY button
	35.	VXA-096	PAUSE button
	36.	VXA-097	STOP button
	37.	VBH-060	Spring
	38.	VAH-013	Front panel
	39.	VAH-019	Escutcheon
	40.		Joint
	41.		Clip
⚠	42.	VSB-001	Voltage selector (HE model)
⚠	43.	VSB-002	Voltage selector (S model)

Mark	No.	Part No.	Description
	51.	ACZ30P060FMC	
	52.	ACZ30P060FZK	
	53.	BCZ30P050FMC	
	54.	BCZ30P160FMC	
	55.	BMZ26P040FZK	
	56.	ICT40P080FZK	
	57.	PMZ40P060FMC	
	58.	VBZ30P060FZK	
	59.	VBZ30P060FMC	
	60.	VPZ30P060FMC	
	61.	NB26FMC	
	62.	WB60FMC	
	63.	YE50FUC	
	64.		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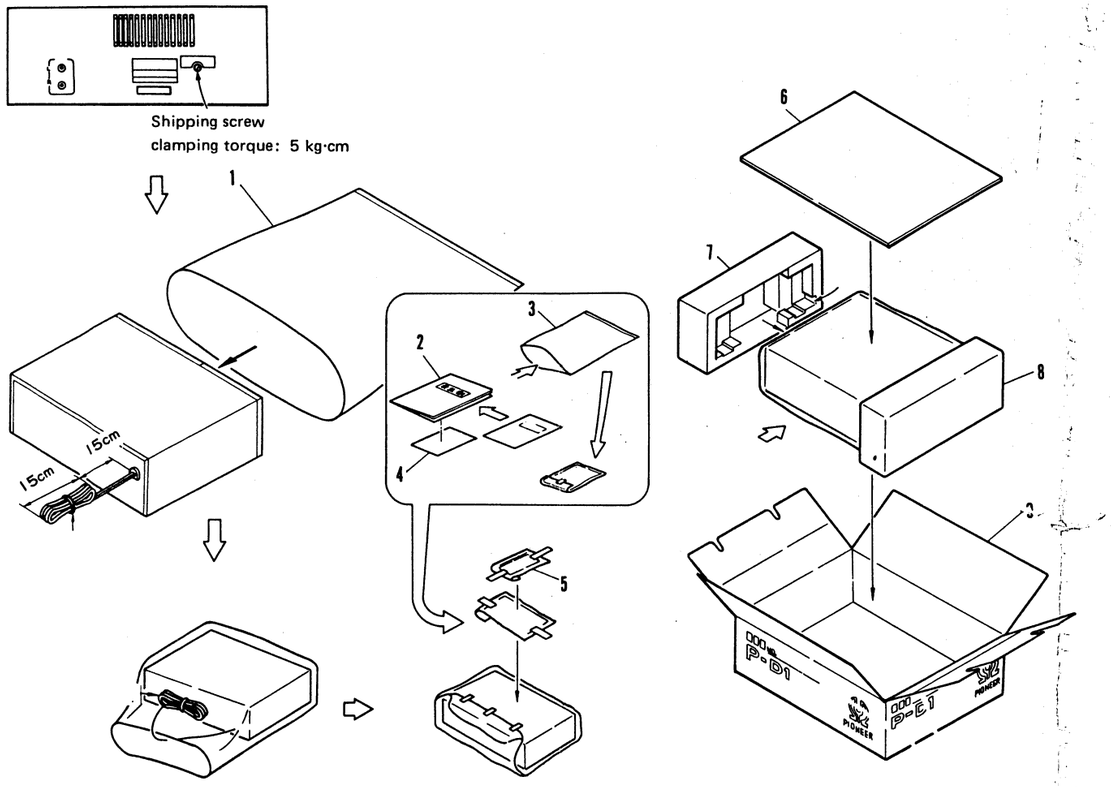
Parts List

Mark	No.	Part No.	Description
	1.	VLL-139	Mech-chassis
	2.	VNE-340	Height adjustment screw
	3.		Stopper
	4.	VBH-068	Screw
	5.		Collar
	6.	VWY-030	CNBA
	7.	VLA-061	Nut
	8.	VNG-005	Rail
	9.	VNL-119	Retainer
	10.	VLL-121	Roller
	11.	VXX-006	Retainer-pinion
	12.		Slider base
	13.		Rack
	14.		Pickup holder
	15.	VNH-026	Ball
	16.	VLL-119	Bar
	17.	VGN-012	Pickup
	18.	VLL-116	Attachment screw
	19.	VBH-067	Screw
	20.	VLL-118	Spacer
	21.	VLL-117	Collar
	22.	VLL-120	Cam
	23.	VNE-338	Plate
	24.	VXM-023	Carriage motor
	25.	VXA-083	Holder
	26.	VNL-139	Pinion gear
	27.	VNE-345	Angle
	28.	VBH-072	Spring
	29.	VXM-022	Spindle motor
	30.	VLL-138	Height adjustment boss
	31.	VXA-085	Brake plate B
	32.	VXA-084	Brake plate A
	33.	VEB-040	Brake shoe
	34.	VBH-070	Spring
	35.	VNE-347	Shielding cover
	36.	VBH-069	Spring
	37.	VLL-125	Tapered wheel
	38.		Holder
	39.	VWV-032	HALC
	40.		Shielding case
	41.	VXA-090	Front frame
	42.	VBH-065	Shutter plate
	43.	VLL-110	Spring
	44.		Bar
	45.		Boss
	46.		Boss
	47.	VED-031	Cushion
	48.	VNL-121	Holder base
	49.	VNL-126	Holder plate A
	50.	VNL-127	Holder plate B
	51.	VNL-128	Holder plate C
	52.	VNL-134	Disc clamper
	53.	VNL-132	Clamper holder
	54.	VNL-133	Clamper cap
	55.	VNH-025	Ball
	56.	VNL-160	Bearing
	57.	VBH-077	Spring
	58.		Door plate
	59.	VBH-012	Spring
	60.	VXX-083	Door panel
	61.	VBH-063	Spring
	62.	VBH-064	Spring
	63.	VBH-062	Spring
	64.	VXA-091	Dumper bracket
	65.	VNL-151	Gear
	66.	VEC-097	Dumper
	67.	VNL-131	Rack
	68.	VNL-125	Cover
	69.	VXA-086	Side frame L
	70.		Plate
	71.	VNL-136	Roller
	72.	VXA-088	Gear
	73.	VNL-123	Pulley
	74.		Plate
	75.	VEB-042	Insulator
	76.	VXX-117	Eject motor
	77.	VBA-004	Screw
	78.	VEB-043	Belt
	79.	VSF-009	Micro-SW
	80.	VWY-031	CNBB
	81.	VXA-087	Lever
	82.	VBH-061	Spring
	83.		Plate
	84.	VNE-315	Side frame R
	85.	VAH-015	Escutcheon L
	86.		Plate
	87.	VAH-019	Escutcheon
	88.	VXX-084	Mechanism Assembly
	101.	ACZ30P060FMC	
	102.	BCZ30P050FMC	
	103.	BMZ26P040FZK	
	104.	CMZ20P040FZK	
	105.	CMZ30P080FZK	
	106.	PBZ20P060FZK	
	107.	PMA30P060FMC	
	108.	PMA30P080FMC	
	109.	PMA30P100FMC	
	110.	PMA30P120FMC	
	111.	PMB26P060FMC	
	112.	PMB30P060FMC	
	113.	PMB30P160FMC	
	114.	PMC26P100FMC	
	115.	PMZ26P100FMC	
	116.	PMZ30P060FMC	
	117.	PMZ40P180FMC	
	118.	ZMD30H250FBT	
	119.	ZMK40H080FBT	
	120.		
	121.	WB50FMC	
	122.	WW50FBT	
	123.	YC25FBT	
	124.	YE20FUC	
	125.	YE25FUC	
	126.	YE30FUC	

7. PACKING MATERIALS



Parts List

Mark	No.	Part No.	Description
	1.	VHA-043	Bag
	2.	VRD-001	Operating Instructions (HE model)
	2.	VRB-018	Operating Instructions (S model)
	3.	VHL-014	Polyethylene bag
	4.		
	5.	VDE-028	Connecting cord
	6.	VHC-012	Cardboard plate
	7.	VHA-037	Side pad L
	8.	VHA-038	Side pad R
	9.	VHG-039	Packing case (HE model)
	9.	VHG-056	Packing case (S model)

8. SPECIFICATIONS

1. General

System . . . . . Compact Disc digital audio system
Disc . . . . . Diameter: 120mm
Thickness: 1.2mm
Max. playing time: over 60 min. (stereo)
Linear speed: 1.2 ~ 1.4m/sec
Direction of rotation (signal encoded side): Counterclockwise
Signal format . . . . . Sampling frequency: 44.1kHz
Quantization bits: 16 bits, linear
Transmission bit rate: 4.3218Mbits/sec
Modulation system: EFM
Error correction system: CIRC
Pre-emphasis: 50/15μsec
Laser . . . . . Semiconductor laser, wavelength 0.78μm
Power requirement . AC 220V, 240V (switchable) 50/60Hz
Power consumptions . . . . . 46 watts
Net weight (without package) 12.1kg (26.7lbs)
Dimensions . . . . . 420(W) x 330(D) x 140(H) mm.
16-17/32(W) x 13(D) x 5-1/2(H) in.

2. Audio Characteristics

Audio output . . . . . 2-channel stereo
Frequency response . . . . . 5Hz to 20kHz (±0.5dB)
Signal-to-noise ratio . . . . . More than 90dB
Dynamic range . . . . . More than 90dB
Channel separation . . . . . More than 90dB (1 kHz)
Wow and flutter . . . . . Quarts oscillator accuracy
Total harmonic distortion . . Less than 0.006% (1kHz, 0dB)
Output voltage . . . . . 190mVrms (1kHz, –20dB)

3. Functions

- Play
- Pause
- Index scan
- Repeat
- Skip
- Time display
- Phrase display
- Time search
- Phrase search
- Program play
- Program check
- Total display

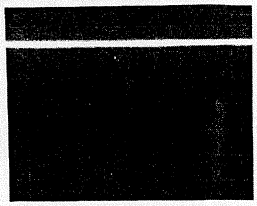
4. Furnished Accessories

- Audio connecting cords with pin plugs 1
- Operating Instructions 1

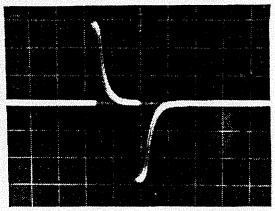
NOTES:
Specifications and the design subject to possible modification without notice, due to improvements.

9. WAVEFORMS

TP207 (SRVB)
Mode; Play Trkg C/L
X; 0.2V/div Y; 5msec/div



TP227 (SRVB)
Mode; Jump Rev
X; 20mV/div Y; 0.2msec/div



TP208 (SRVB)
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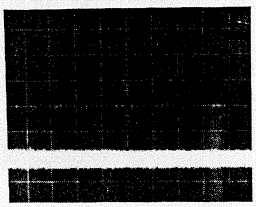
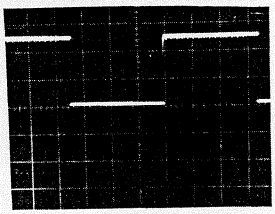
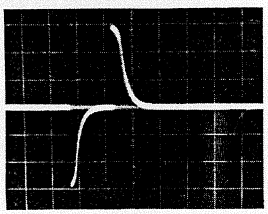
X; 20mV/div Y; 10msec/div



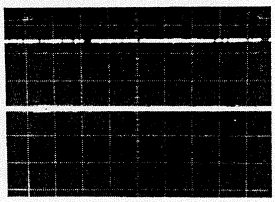
WFCK
Mode; Play
X; 0.2V/div Y; 20μsec/div



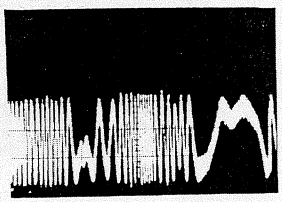
TP227 (SRVB)
Mode; Jump Fwd
X; 20mV/div Y; 0.2msec/div



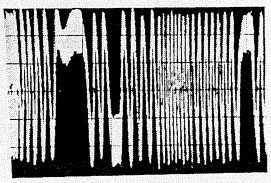
N19-5
Mode; Play Trkg O/L
X; 0.2V/div Y; 2msec/div



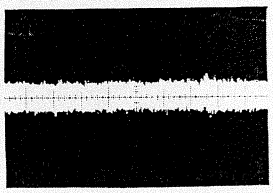
TP208 (SRVB)
Mode; Play Trkg O/L
X; 20mV/div Y; 10msec/div



TP210 (SRVB)
Mode; Play Trkg O/L
X; 0.1V/div Y; 10msec/div



TP210 (SRVB)
Mode; Play Trkg C/L
X; 0.1V/div Y; 10msec/div



TP209 (SRVB)
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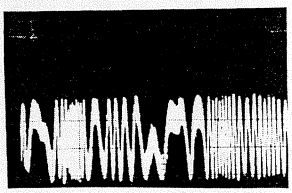
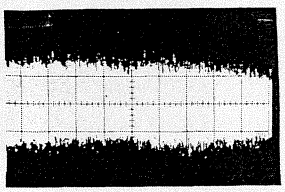
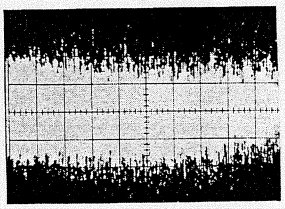
X; 20mV/div Y; 10msec/div



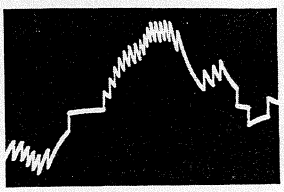
TP212 (SRVB)
Mode; Play Trkg C/L
X; 20mV/div Y; 10msec/div



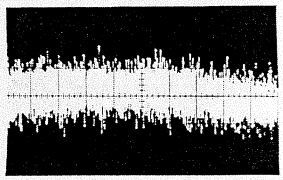
TP215 (SRVB)
Mode; Play Trkg O/L
X; 0.1V/div Y; 10msec/div



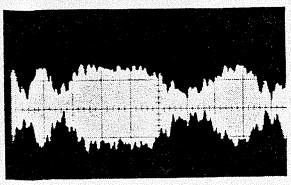
TP222 (SRVB)
Mode; Play Trkg O/L
X; 5mV/div Y; 10msec/div



TP216 (SRVB)
Mode; Play Trkg C/L
X; 20mV/div Y; 10msec/div



TP227 (SRVB)
Mode; Play Trkg O/L
X; 20mV/div Y; 2msec/div



TP222 (SRVB)
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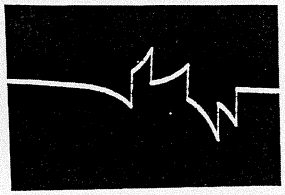
X; 20mV/div Y; 10msec/div



TP227 (SRVB)
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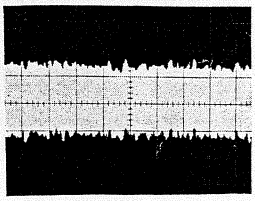
X; 10mV/div Y; 2msec/div



TP229 (SRVB)
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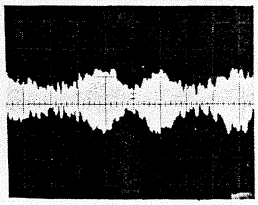
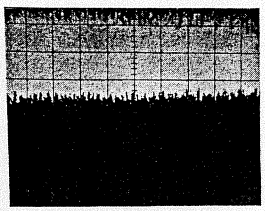
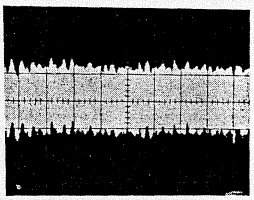
X; 2mV/div Y; 2msec/div



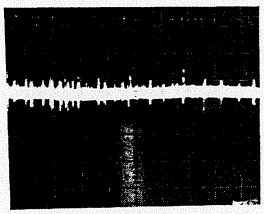
TP230 (SRVB)
Mode; Play Trkg C/L
X; 10mV/div Y; 2msec/div



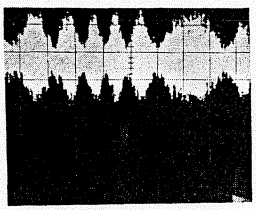
TP229 (SRVB)
Mode; Play Trkg C/L
X; 2mV/div Y; 2msec/div



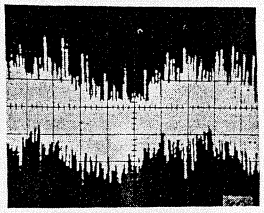
TP231 (SRVB)
Mode; Play Trkg C/L
X; 2mV/div Y; 2msec/div



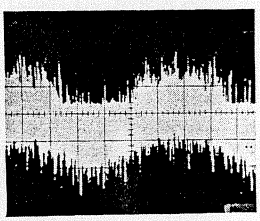
TP230 (SRVB)
Mode; Play Trkg O/L
X; 10mV/div Y; 2msec/div



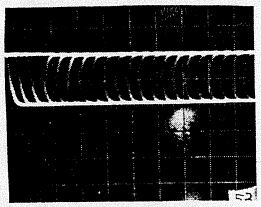
TP232 (SRVB)
Mode; Play Trkg O/L
X; 10mV/div Y; 20msec/div



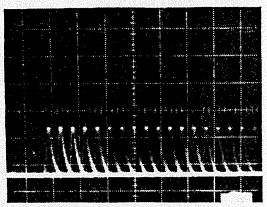
TP232 (SRVB)
Mode; Play Trkg C/L
X; 10mV/div Y; 20msec/div



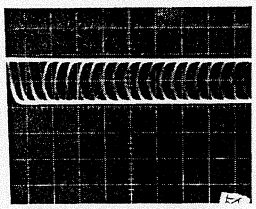
TP9 (SRVB)
Mode; Play Trkg C/L
X; 0.2V/div Y; 0.5μsec/div



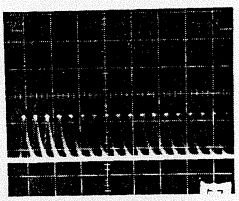
TP1 (SRVB)
Mode; Play Trkg C/L
X; 0.2V/div Y; 0.5μsec/div



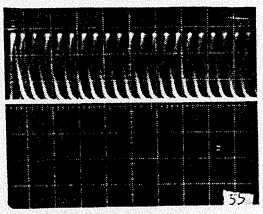
TP10 (SRVB)
Mode; Play Trkg C/L
X; 0.2V/div Y; 0.5μsec/div



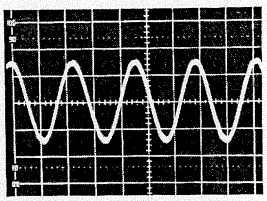
TP2 (SRVB)
Mode; Play Trkg C/L
X; 0.2V/div Y; 0.5μsec/div



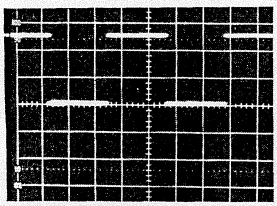
TP11 (SRVB)
Mode; Play Trkg C/L
X; 0.1V/div Y; 0.5μsec/div



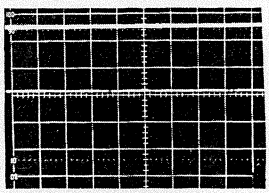
TP6 (SRVB) Mode; Play
X; 50mV/div Y; 0.1μsec/div
DC; 4V



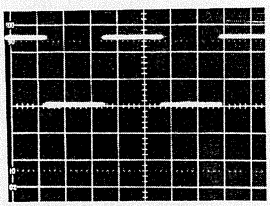
TP19 (SRVB)
Mode; Play
X; 0.2V/div Y; 1msec/div



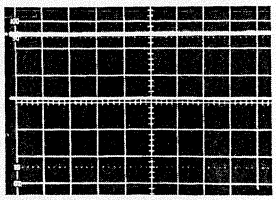
TP17 (SRVB)
Mode; Play
X; 0.2V/div Y; 10msec/div



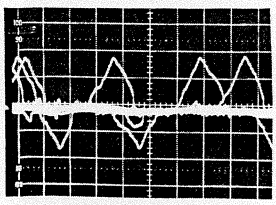
TP20 (SRVB)
Mode; Play
X; 0.2V/div Y; 1msec/div



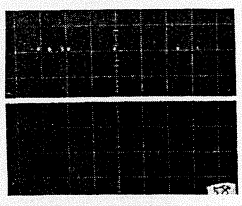
TP18
Mode; Play
X; 0.2V/div Y; 10msec/div



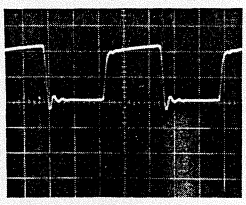
TP21 (SRVB)
Mode; Play Trkg O/L
X; 50mV/div Y; 5msec/div



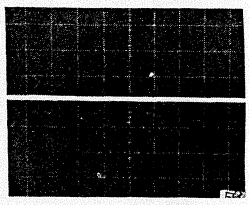
TP16 (SRVB)
Mode; Play Trkg O/L
X; 0.2V/div Y; 20msec/div

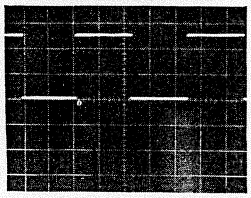
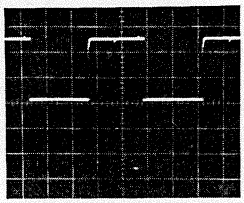
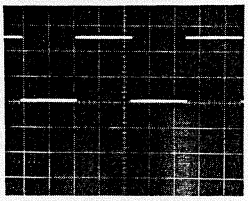
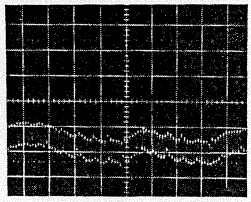
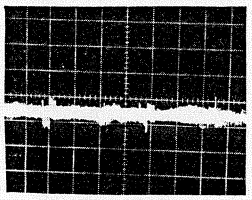
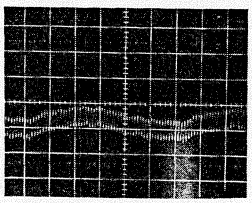
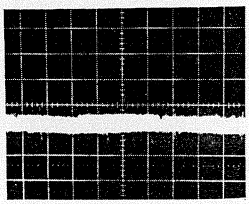
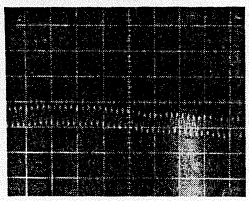
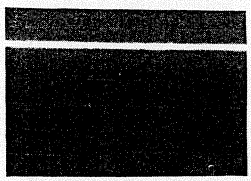
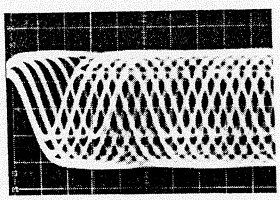
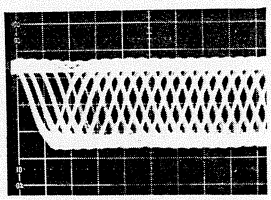
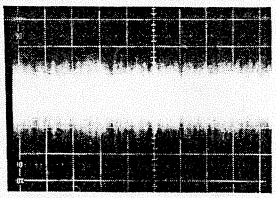
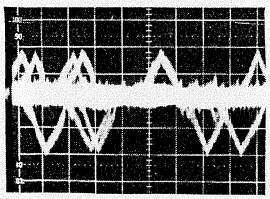
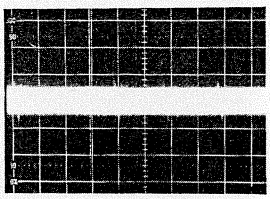
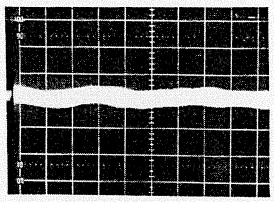
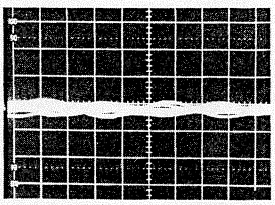
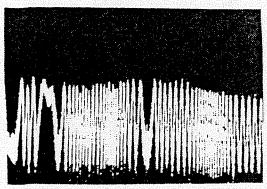
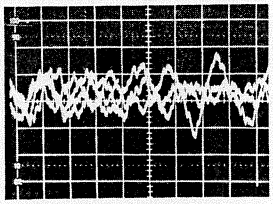
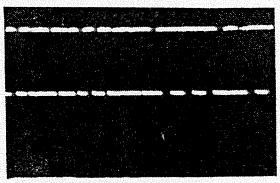
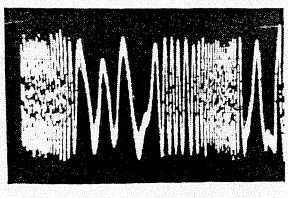


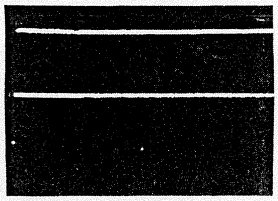
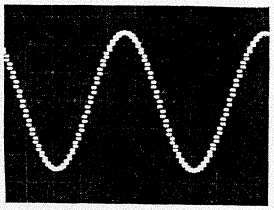
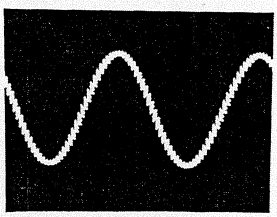
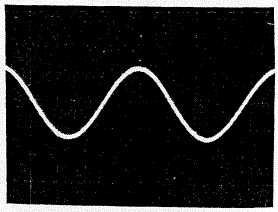
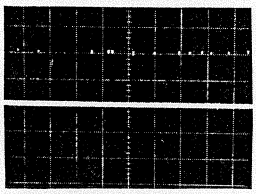
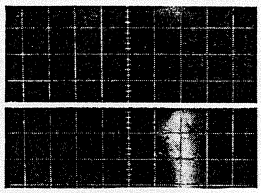
N20-5 (SRVB)
Mode; Play
X; 0.2V/div Y; 50msec/div



TP16 (SRVB)
Mode; Play Trkg C/L
X; 0.2V/div Y; 20msec/div



230S (SRVB) Mode; Play X; 0.2V/div Y; 1msec/div 	TP8 (DCDR) Mode; Play X; 0.2V/div Y; 5μsec/div 	230M (SRVB) Mode; Play X; 0.2V/div Y; 1msec/div 	TP24 (SRVB) Mode; Play X; 0.1V/div Y; 20msec/div 
TP202 (SRVB) Mode; play Trkg C/L X; 0.1V/div Y; 5msec/div 	TP25 (SRVB) Mode; Play X; 0.1V/div Y; 20msec/div 	TP203 (SRVB) Mode; Play Trkg C/L X; 0.1V/div Y; 5msec/div 	TP25 (SRVB) Mode; Play X; 0.1V/div Y; 10msec/div 
TP207 (SRVB) Mode; Play Trkg O/L X; 0.2V/div Y; 5msec/div 	TP12 (RF) (SRVB) Mode; Play X; 5mV/div Y; 0.5μsec/div 	TP13 (SRVB) Mode; Play X; 0.1V/div Y; 0.5μsec/div DC; 6.0V 	TP7 (DL) (SRVB) Mode; Play Trkg O/L X; 50mV/div Y; 2msec/div 
TP4 (SRVB) Mode; Play X; 50mV/div Trkg O/L DC; 5.5V Y; 5msec/div 	TP7 (DL) (SRVB) Mode; Play Trkg C/L X; 50mV/div Y; 2msec/div 	TP4 (SRVB) Mode; Play X; 50mV/div Trkg C/L DC; 5.5V Y; 5msec/div 	TP21 (SRVB) Mode; Play Trkg C/L X; 50mV/div Y; 5msec/div 
TP203 (SRVB) Mode; Play Trkg O/L X; 50mV/div Y; 10msec/div 	TP23 (SRVB) Mode; Play X; 20mV/div Y; 10msec/div 	TP205 (SRVB) Mode; Play Trkg O/L X; 0.2mV/div Y; 2msec/div 	TP202 (SRVB) Mode; Play Trkg O/L X; 0.1V/div Y; 10msec/div 

TP205 (SRVB) Mode; Play Trkg C/L X; 0.2mV/div Y; 2msec/div 	Z12-17 (DCDR) 1kHz Test Mode; Playing Signal X; 0.2V/div Y; 0.2msec/div 	DCDR OUT (Lch) 1kHz Test Mode; Playing Signal X; 50mV/div Y; 0.2msec/div 	Line Out 1kHz Test Signal Mode; Playing X; 0.2V/div Y; 0.2msec/div 
TP15 (SRVB) Mode; Play Trkg O/L X; 0.2V/div Y: 20msec/div 	TP15 (SRVB) Mode; Play Trkg C/L X; 0.2V/div Y; 20msec/div